NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Working Diving Standards and Safety Manual

Version 1.0

July 14, 2011

FOREWORD

This document represents the minimum safety standards for working diving under the auspices of the National Oceanic and Atmospheric Administration (NOAA) as of the approval date of this manual. As diving progresses so shall this standard and it is the responsibility of every NOAA diver to ensure that it continues to reflect the latest information on safe diving practices.

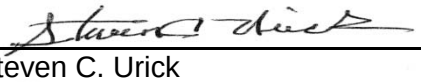
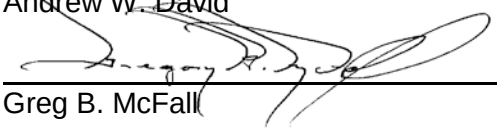
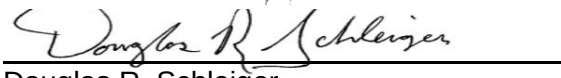
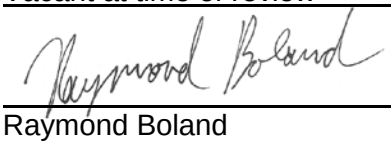
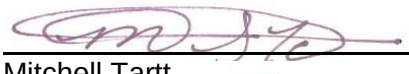
REVISION HISTORY

DATE:	DESCRIPTION:
July 14, 2011	Original document approved

APPROVALS:

OMAO Director	 RADM Jonathan W. Bailey, NOAA	7 June 2011

NOAA Diving Control and Safety Board

Diving Program Manager	 David A. Dinsmore	17 May 2011
Diving Safety Officer	 Steven C. Urick	17 May 2011
NMFS Diving Officer	 Andrew W. David	17 May 2011
NOS Diving Officer	 Greg B. McFall	17 May 2011
OMAO Diving Officer	 Douglas R. Schleiger	17 May 2011
OAR Diving Officer	Vacant at time of review	
NMFS Deputy Diving Officer	 Raymond Boland	17 May 2011
NOS Deputy Diving Officer	 Mitchell Tartt	17 May 2011
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SECTION 1: ADMINISTRATION

1.1 General Provisions

1.1.1 Purpose.

A. Code of Federal Regulations (CFR), 29 CFR Part 1910, Occupational Safety and Health Standards (OSHA), Subpart T, titled “Commercial Diving Operations,” requires employers to develop and maintain a safe practices manual.

B. This manual prescribes policies and procedures for conducting working diving operations under the auspices of the National Oceanic and Atmospheric Administration (NOAA), and is to be used in conjunction with the standards outlined in NOAA Administrative Order (NAO) 209-123 and 29 CFR Part 1910, Subpart T (Appendix 10).

C. NOAA does not conduct ‘liveboating” or use “heavy gear” as defined in 29 CFR Part 1910, Subpart T and therefore, those activities are not addressed in this manual.

1.1.2 Scope and Application.

A. The policies and procedures in this manual apply to:

1) All NOAA working diving operations regardless of the geographic location or the specific underwater tasks performed;

2) All NOAA employees engaged in working diving activities during official duty hours (i.e., when receiving financial compensation for work performed) where compressed gas is breathed in a hyperbaric environment; and

3) Non-NOAA personnel performing working dives under the direct supervision of a NOAA Divemaster (DM) or Lead Diver (LD). For the purposes of this manual NOAA employees and non-NOAA personnel diving under the auspices of NOAA shall be collectively referred to as “NOAA divers.”

B. Working versus Scientific dives. Unit Diving Supervisors (UDS) or designee shall be responsible for determining whether dive operations are to be conducted per this manual or the NOAA Scientific Diving Standards and Safety Manual based on review of the dive plan. Criteria to be used to distinguish between a working and scientific dive are presented at www.osha.gov and in the list below. A negative answer to any of the following questions would require the task to be conducted as a working dive following the standards outlined in this manual.

Can the tasks be accomplished using simple hand tools (e.g., small hammers, pliers, chisels, wrenches, cameras, measuring tapes, nets, collection jars) weighing 25 pounds or less underwater?
Do the tasks require the expertise of a scientist or scientist-in-training?
Can the tasks be accomplished with minimal physical exertion?
Can the tasks be accomplished in short duration (e.g., <1-hour)?
Are the tasks limited solely to the observation of natural phenomena or responses of natural systems and/or gathering of data for scientific analysis?
If any object is to be lifted or moved, is its weight underwater <100 pounds?
Will the tasks result in the advancement of science?

C. When conducting mixed operations (i.e., dives involving both working and scientific tasks), or when in doubt as to the nature of the dive (i.e., scientific versus working), the dive shall be conducted as a working dive per this manual.

1.1.3 Obligations, Restrictions and Conditions.

A. The NDP ensures that all NOAA divers are in compliance with:
   1) All standards of general applicability outlined in 29 CFR Part 1910, Subpart T; and
   2) All standards and procedures outlined in this manual.
B. The NOAA Diving Control and Safety Board (NDCSB) may elect to implement and enforce more stringent diving standards and procedures than those stated herein. Such changes will be promulgated in writing to all affected employees and supervisors prior to implementation and will be included in the next revision to this manual.
C. Failure to comply with the standards outlined in this manual may be cause for the revocation or restriction of the diver's certification by action of the NDCSB.
D. No person shall engage in working diving operations under the auspices of the NOAA diving program unless they hold a current certification issued pursuant to the provisions of this standard.
E. No dive team member shall be exposed to hyperbaric conditions against their will, except when necessary to prevent or treat a pressure-related injury.
F. No dive team member shall be permitted to dive with any known medical condition that is likely to adversely affect the safety and health of the diver or other dive team members.

1.1.4 Substitutions for Required Equipment, Materials, Apparatuses, Arrangements, Procedures, or Tests.

A. The NDCSB may accept substitutes for equipment, materials, apparatuses, arrangements, procedures, or tests required in this standard if it can be demonstrated the substitutes provide an equivalent or increased level of safety, and the substitutes remain compliant with OSHA standards outlined in 29 CFR 1910, Subpart T.
B. Where it is shown to the satisfaction of the NDCSB that the use of any particular equipment, material, apparatus, arrangement, procedure, or test is unreasonable or impracticable, the NDCSB may permit the use of alternate equipment, material, apparatus, arrangement, procedure, or test to such an extent and upon such condition that insures, to the satisfaction of the NDCSB, a degree of safety consistent with the minimum standards set forth in this manual, and the substitution remains compliant with OSHA standards outlined in 29 CFR 1910, Subpart T.

1.1.5 Deviations in Emergencies.

A. NOAA divers may deviate from the requirements of this manual provided that:
   1) The deviation is necessary to prevent or minimize a situation which is likely to cause death, serious physical harm, total loss of property, or major environmental damage; and
   2) The DM or LD notifies the NOAA Diving Program Manager (NDPM), UDS, and Line/Staff Office Diving Officers (LODO/SODO) of the deviation within 24 hours of the onset of the emergency situation.
B. The NDPM will notify the OSHA Area Director and the Office of Marine and Aviation Operations (OMAO) Director within 48 hours of the onset of the emergency situation indicating the nature of the emergency and extent of the deviation from the prescribed regulations, and submit such information in writing upon request of the OSHA Area Director.

1.1.6 Manual Revisions.

A. The NDCSB shall review this manual at a minimum of every 2 years and revise it as needed or whenever 29 CFR 1910 Subpart T is revised.
B. This manual shall be:
   1) Issued, updated, and maintained by the NDP; and
   2) Distributed in paper or electronic form.

1.1.7 Reference Material.

A. A copy of this manual, NAO 209-123, all NOAA Diving Safety Bulletins, and the latest edition of the NOAA Diving Manual shall be made available to each dive team member.
B. This manual, NAO 209-123, and all Safety Bulletins can be viewed and downloaded from the NOAA Diving Center (NDC) website at: www.ndc.noaa.gov.
C. Each NOAA diver, who is either NOAA-trained or granted equivalency by the NDPM, shall have access to a copy of this document and the NOAA Diving Manual.

1.2 Program Mission, Goals, Core Products and Services, and Management

1.2.1 Program Mission. The mission of the NDP is to train, certify, and equip scientists, engineers, and technicians to perform a variety of underwater tasks in support of NOAA's mission, and to ensure that all NOAA diving operations are conducted safely, efficiently, and economically.

1.2.2 Goals, Core Products and Services.

A. Establish standards and implement policies and procedures for conducting safe diving operations.
B. Train and certify scientists, engineers, and technicians in diving and diving medicine-related subjects.
C. Provide NOAA divers with safe, state-of-the-art, and well maintained dive equipment.
D. Provide guidance and expertise to the NOAA diving community.
E. Investigate and implement new diving technologies and techniques for NOAA divers.
F. Provide equipment, personnel, and expertise to NOAA field operations, as needed.
G. Promote NOAA and the NDP through education and outreach.
H. Promote, facilitate, and implement coordination and communication between the private sector, academic, and government diving entities.

1.2.3 Management.

A. The OMAO Director has overall administrative responsibility for the NDP.
B. Management of the diving program is delegated from the OMAO Director to the NDPM.
C. The NDCSB reviews and establishes diving regulations, policies, and procedures deemed necessary to ensure a safe and efficient diving program.
D. As required by 29 CFR 1910, Subpart T, the NDCSB has autonomous and absolute authority over diving operations.

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SECTION 2: PERSONNEL

Duties and responsibilities delegated herein to specific roles and positions may not be further re-delegated unless specifically authorized in this manual.

2.1 NOAA Diving Program Manager

2.1.1 General.

A. Selected by the OMAO Director from a certified list of candidates from the Workforce Management Office (WFMO) with recommendations from the NDCSB.
B. Administers and manages the NDP.
C. Serves as a voting member of the NDCSB.
D. May permit aspects of the NDP to be carried out by a qualified designee, although the NDPM may not delegate responsibility for the overall safe conduct of the NDP.

2.1.2. Responsibilities.

A. Implements all policies and decisions prescribed by the NDCSB.
B. Safety.
   1) Responsible to the OMAO Director for the management of the NDP;
   2) Reviews recommendations from the NOAA Diving Safety Officer (NDSO) and takes appropriate action; and
   3) Suspends diving operations considered to be unsafe or unwise.
C. Investigates new diving technologies and techniques.
D. Suspends or revokes diving privileges for violating the standards and procedures in this manual as directed by the NDCSB.

2.1.3 Management and Administration.

A. Conducts an annual review of all NOAA diving operations and submits a report to OMAO Director.
B. Monitors and enforces compliance with the applicable federal regulations and the NOAA Diving Standards and Safety Manuals (NDSSM).

2.1.4 Training and Certification.

A. Determines completion of certification requirements and issues NOAA diver certifications and authorizations to dive.
B. Signs all “Letters of Authorization to Dive,” “Dive Certifications,” “Diver ID Cards” and “Letters of Reciprocity” (LOR).

2.1.5 Qualifications.

A. NOAA certified diver, or equivalent, as determined by the NDCSB;
B. Have a minimum of 15 years experience in diving or related field; and
C. Broad technical and/or scientific expertise in research related diving (e.g., safety, regulations, equipment, procedures.

2.2 NOAA Diving Control and Safety Board

2.2.1 General.

A. The NDCSB is an appointed board of representatives from NOAA's Line and Staff Offices (LO/SO) who report to the OMAO Director, and are responsible for the safety and effectiveness of the NDP.
B. Although the NDCSB reports to the OMAO Director, per 29 CFR 1910, Subpart T, the NDCSB exercises autonomous and absolute authority over operations of the NDP for both working and scientific dives.
C. The NDCSB shall meet annually in person and should meet monthly via teleconference, unless special meetings are required to address time sensitive issues.

2.2.2 Composition and Qualifications.

A. The voting members of the NDCSB shall include the following individuals:
   1) NDPM;
   2) LODOs/SODO with active diving programs;
   3) NOAA Deputy Line and Staff Office Diving Officers (DLODOs/DSODO) with active diving programs; and
   4) NDSO.
B. The NOAA Diving Program Diving Medical Officer (NDP DMO) shall be a non-voting member of the NDCSB.
C. The NDCSB may consult individual advisors or advisory panels with subject matter expertise to provide additional information.
D. All Members of the NDCSB shall be NOAA certified divers with a majority being qualified, active scientific divers.
E. A separate, non-voting Executive Secretariat, appointed by the Chairperson, may be appointed to assist the NDCSB administratively.

2.2.3 Selection of NDCSB Members.

A. NDPM is selected by the OMAO Director from a list of candidates provided by the WFMO.
B. LODOs are appointed by NOAA Assistant Administrators from LOs with active diving programs.
C. SODO is appointed by the OMAO Director.
D. DLODOs/DSODO are appointed by the respective LODO/SODO with concurrence of their immediate supervisors.

2.2.4 Chairperson.

A. To avoid conflict of responsibilities, the NDSO is not eligible to serve as the Board Chairperson.
B. The Chairperson shall be selected from the remaining list of voting members by majority vote of all voting members.

2.2.5 Decision Making Process.

A. The Chairperson shall strive for consensus on all NDCSB issues and decisions, and every attempt shall be made to query each voting member of the NDCSB on all decisions.
B. A quorum of two-thirds of the voting members must be present, in person or electronically, to conduct official business.
C. Decisions shall be made by majority vote with the Chairperson casting the deciding vote in the case of a tie.
D. Major objections to majority votes shall be made part of the meeting minutes. Any voting member of the NDCSB may request that an item be raised to the OMAO Director via written communication from the Chairperson.

2.2.6 Term Limits.

A. The Chairperson shall serve a 1 year term, and may be re-elected.
B. The NDPM and NDSO are non-rotating members of the NDCSB. All other members should serve a maximum of 5 consecutive years.
C. Appointments should be scheduled so only one member rotates off the NDCSB per year.

2.2.7 Responsibilities.

A. General.
   1) Exercises autonomous and absolute authority over and promotes the safe and effective operations of the NDP for both working and scientific dives;
   2) Establishes such processes and program structure as necessary to effectively approve and monitor diving projects across NOAA's geographically dispersed diving program;
   3) Reviews and approves all working diving operations involving equipment other than open-circuit SCUBA, breathing mixtures other than air, or depths greater than 100 fsw; Reviews and approves all scientific diving operations involving equipment other than open-circuit SCUBA, breathing mixtures other than air or Nitrox, depths greater than 130 fsw or bottom times beyond the U.S. Navy no-decompression limits; and
   4) Delegates authority to Unit Diving Supervisors (UDS) to review and approve routine dive operations conducted at the unit level.
B. Safety.
   1) Ensures sufficient oversight for safety exists within NDP;
   2) Participates in safety assessments as necessary;
   3) Advises the OMAO Director, and the Safety and Environmental Compliance Office SECO Director of circumstances adversely impacting safety and/or efficiency of the NDP; and
   4) Instructs and reminds divers, LDs, DMs, and UDSs to adhere to all NDP diving regulations, standards, policies, and procedures.
C. Incident Review and Action.
   1) Serves as a board of review for inquiries into the nature and cause of diving incidents (including near-misses) as well as violations of NOAA or other applicable policies and standards, and reports the results to the OMAO Director and the SECO Director;
   2) For Class ‘A’ incidents involving a fatality or severe injury, or other cases constituting a “serious incident” under the NOAA Safety Policy (NAO 209-1), responsibility for the conduct of the official investigation and corrective action is retained by SECO;
   3) Institutes appropriate measures to mitigate the reoccurrence of dive incidents; and
   4) Prescribes action for unsafe or noncompliant practices or actions.
D. Manuals and Procedures.
   1) Develops and promulgates NDSSMs, and reviews and revises them as necessary;
   2) Monitors compliance with NDSSMs, including establishing such compliance inspection and certification programs as necessary, and reports non-compliance to the DPM for action; and
   3) Reviews and makes changes in other NOAA diving regulations, standards, policies, and operational procedures.
E. Training and Certification.
   1) Establishes and/or approves training and certification programs for NOAA divers and non-NOAA divers participating in NOAA-sponsored dive projects;
   2) Reviews, adopts, and enforces physical conditioning and medical standards required to promote diver safety;
   3) Recommends to the NDPM the revocation of diving certifications;

4) Determines equivalency of applicant entities with that of the NDP for diving reciprocity; and
5) Considers appeals from divers whose dive certifications are suspended.

F. Standardized Equipment Program.
1) Considers, reviews, and makes appropriate changes in diving equipment requirements; and
2) Reviews and approves new diving technologies and techniques for possible implementation.

2.3 NOAA Diving Safety Officer

2.3.1 General.

A. The NDSO is selected by the OMAO Director from a certified list of candidates from WFMO with recommendation from the NDCSB.
B. Reports to the OMAO Director.
C. Voting member of the NDCSB.

2.3.2 Responsibilities.

A. Provides advice to the NDCSB, NOAA managers, and divers for working and scientific diving safety and health related issues.
B. Provides assistance with NOAA diving safety issues to other NOAA offices and coordinates resolution of NOAA diving safety issues as directed by the OMAO Director.
C. Coordinates annual safety inspections of all NOAA dive units and provides findings to the NDPM, NDCSB, and OMAO Director.
D. May permit portions of this program to be carried out by a qualified delegate, although the NDSO may not delegate responsibility for the overall safe conduct of the NDP.
E. Investigates, subject to and consistent with the incident investigation parameters in NAO 209-1, all Class B diving mishaps and provides findings to the NDPM, NDCSB, OMAO Director, and SECO Director.
F. Suspends diving operations considered to be unsafe or unwise and reports this action to the NDCSB. Reauthorization for diving may be granted by the LODO/SODO after the completion of a Corrective Action Plan (CAP).
G. As directed by the OMAO Director, assesses appropriateness and consistency of diving safety requirements for NOAA federal, grant, and contract procedures, and provides recommendations to appropriate NOAA managers and the NDCSB.
H. Conducts an annual safety assessment of the NDP and such other ad hoc assessments as appropriate or as directed by the OMAO Director, and reports on the results of such assessments to the OMAO Director and the NDCSB including recommendations or actions taken to strengthen the safety and effectiveness of the NDP.

2.3.3 Qualifications.

A. NOAA DM or equivalent as determined by the NDCSB;
B. Have a minimum of 10 years experience in diving;
C. Broad technical and/or scientific expertise in research related diving (e.g., safety, regulations, equipment, procedures); and
D. Shall be a current or previously-certified SCUBA instructor from an internationally recognized certifying agency.

2.4 Line and Staff Office Diving Officers

2.4.1 General.

A. Senior representatives for diving for the National Oceans Service (NOS), National Marine Fisheries Service (NMFS), Oceanic and Atmospheric Research (OAR), and OMAO.
B. LODOs are appointed by their respective Assistant Administrators, with concurrence of the NDCSB and approval of the employee's immediate supervisor.
C. SODO is appointed by the OMAO Director, with concurrence of the NDCSB and approval of the employee's immediate supervisor.
D. Duties and responsibilities are included in the LODO/SODO performance plans.

2.4.2 Responsibilities.

A. Safety.
   1) Conducts, or delegates, annual on-site diving unit safety inspections, and forwards reports to the NDSO by January 31st of each year;
   2) Serves as subject matter experts, as requested, for the SECO and the SECO-assigned investigative teams for incidents involving a fatality or severe injury, or other criteria constituting a "serious incident" under NAO 209-1. Responsibility for conducting the investigation and tracking completion of corrective actions is retained by SECO;
   3) Reviews diving accidents and incidents which are not covered in the previous item that occur within the respective LO/SO, and reports findings, recommendations, and/or proposed changes to the NDSO; and
   4) Suspends diving operations considered to be unsafe or unwise.
   5) Assists in administration of Diving Unit Safety Assessment (DUSA) program.

B. Management and Administration.
   1) Assists as needed in planning and reviewing advanced and/or remote diving operations of assigned units, and ensures compliance with this manual; and
   2) Maintains familiarity with diving activities within assigned units and submits annual report to the NDPM by October 31st of each year for the preceding fiscal year.
C. Training. Determines recertification requirements for divers whose diving authorizations have lapsed by more than 6 months per Section 3.5.
D. Standardized Equipment Program. Verifies accuracy of annual Standardized Equipment Program (SEP) assessment charges for assigned units.

2.4.3 Qualifications.

A. Be a current or former NOAA certified Advanced Working diver unless otherwise authorized by the NDCSB.
B. Meet the requirements for UDS in Section 2.6.
C. Have a minimum of 10 years experience in diving.
D. Must be current in cardiopulmonary resuscitation (CPR), including adult Automated External Defibrillator (AED), first aid and oxygen administration, and be knowledgeable in dive accident management.

2.5 Deputy Line and Staff Office Diving Officers

2.5.1 General.

A. DLODO/DSODO are representatives for diving for each of the NOAA Line (NOS, NMFS, OAR) and Staff (OMAO) Offices.
B. The DLODOs are appointed by their LODOs with approval of the employee's immediate supervisor.
C. The DSODO is appointed by the SODO with approval of the employee's immediate supervisor.
D. Duties and responsibilities are included in the DLODO/DSODO performance plans.
E. Term of service is 1 year, but may be extended by the respective LODO/SODO.

2.5.2 Responsibilities.
A. Serves as a voting member of the NDCSB.
B. Assists LODO/SODO in the performance of assigned duties as requested.

2.5.3 Qualifications.
A. Be a current or former NOAA certified Advanced Working diver unless otherwise authorized by the NDCSB.
B. Meet the requirements for UDS in Section 2.6.
C. Have a minimum of 7 years experience in diving.

2.6 Unit Diving Supervisors

2.6.1 General.
A. Assigned throughout the agency to provide administrative oversight of divers at the facility level within their respective LO/SO.
B. Assigned by their LODO/SODO with concurrence of the NDCSB and approval of the employee's immediate supervisor.
C. Duties and responsibilities are included in UDS's performance plans and may be delegated as appropriate.

2.6.2 Responsibilities.
A. Safety.
1) Ensures competent DMs or LDs are in charge of operations at dive sites;
2) Ensures all diving gear and accessory equipment is maintained in a safe operating condition;
3) Reports all diving-related accidents/incidents that occur within their units to their LODO/SODO as prescribed in this manual, and consistent with NAO 209-1;
4) Approves dive plans and Diving Emergency Assistance Plans (DEAP) for all routine dives involving no-decompression profiles, open circuit SCUBA and using air or Nitrox as a breathing gas;
5) Elevates to the NDCSB all non-routine dive plans and emergency assistance plans for approval prior to commencement of the diving operation;
6) Suspends divers and/or dive operations when deemed necessary and notifies the NDC and their respective LODO/SODO within 48 hours;
7) Conducts a check out dive(s) with all recently certified divers or those transferring from another unit to familiarize them with local conditions, protocols, procedures, and unique hazards prior to permitting unrestricted operational diving;
8) Ensures that any diving conducted using specialized equipment or procedures (e.g., drysuits, full face masks, tethered or line-tended SCUBA) is practiced on an annual basis to maintain diver proficiency. Failure to meet these minimum

standards requires work-up dives to be conducted prior to making operational dives; and

9) Ensures semi-annual air purity tests are completed on all NOAA-owned air compressors and takes corrective action if results are out-of-specifications as delegated by the UDS.
10) Assists in administration of DUSA program.

B. Management and Administration.
   1) Disseminates NOAA diving standards, policies, and procedures to assigned divers;
   2) Maintains or delegates to qualified personnel the responsibility of record keeping (e.g., Letters of Certification, training, and equipment) for assigned divers;
   3) Ensures all divers are certified, properly trained, and fit to perform the required diving;
   4) Conducts or delegates annual dive locker inspection and submits report to their respective LODO/SODO by January 15th of each year;
   5) Submits report of unit diving activities for the preceding fiscal year to their respective LODO/SODO by October 15th of each year;
   6) Prepares diver training applications and submits them to NDC; and
   7) Forwards a copy of all approved dive plans and Diving Emergency Assistance Plans (DEAP) to the appropriate DM or LD responsible for the dive operation and to ndp.diveplans@noaa.gov.

C. Training. Conducts operational training and conducts skills evaluation check-out dives as needed.

D. Standardized Equipment Program.
   1) Keeps NDC apprised of changes to unit roster;
   2) Tracks SEP equipment and ensures gear is returned to NDC upon departure of divers from unit;
   3) Verifies accuracy of annual SEP assessment charges for assigned divers; and
   4) Helps facilitate collection of fees by ensuring a local budget office has the accounting codes from divers' supervisors.

2.6.3 Qualifications.

A. Be a current or former NOAA certified diver;
B. Complete the NOAA DM training program;
C. Should have a minimum of 5 years experience in diving;
D. Demonstrates ability to conduct operational training and skills evaluation checkout dives; and
E. Must be current in CPR, including adult AED, first aid and oxygen administration, and be knowledgeable in dive accident management.

2.7 Divemasters and Lead Divers

2.7.1 General.

A. DMs and LDs shall be in charge of all aspects of the diving operation at the dive site and shall:
   1) Have the experience and training in the conduct of the assigned diving operation;
   2) Have authority over execution of on-site diving operations; and
   3) Be at the dive location.

B. DMs and LDs may dive as long as there is a qualified topside person, designated by the DM or LD, to render assistance in an emergency.
C. Duties and responsibilities are included in DM's performance plans.

2.7.2 Responsibilities.

A. Safety.
   1) Ensures all diving is planned and conducted in accordance with all prescribed NOAA diving standards, policies, and procedures listed in this manual, as well as all applicable OSHA standards outlined in 29 CFR 1910, Subpart T;
   2) Submits dive plans to UDS for approval;
   3) Prohibits any diver from diving who, in their opinion, exhibits problems of a physical or psychological nature that may compromise the safety of a diver or the dive team;
   4) Suspends diving operations when unusual hazards or environmental conditions adversely affect the safety of the diving operation;
   5) Ensures emergency procedures are established and clearly understood by all personnel before diving begins;
   6) Ensures all safety and emergency equipment is in working order and at the dive site;
   7) Ensures all divers are monitored after each dive for signs or symptoms of decompression sickness or other diving-related maladies;
   8) Reports all diving-related accidents and incidents as prescribed in this manual and NAO 209-1;
   9) Coordinates with other known activities in the vicinity that are likely to interfere with diving operations;
   10) Ensures all diver-worn equipment is properly configured in accordance with the standards outlined in this manual;
   11) Obtains concurrence from the vessel captain and ensures all vessel pre-dive checklists (e.g., NOAA Form 64-3) have been completed prior to initiating diving operations when applicable;
   12) Conducts pre- and post-dive safety briefings; and
   13) Assists in administration of DUSA program.

B Management and Administration.
   1) Ensures files are maintained if delegated by the UDS; and
   2) Ensures qualified individuals are assigned to fulfill all required diving and support positions.

C. Training. Conducts operational training and skills evaluation check-out dives of divers as directed by the UDS.

D. Standardized Equipment Program.
   1) Ensures all equipment is in safe operating condition, and required maintenance records are maintained if delegated by their UDS; and
   2) Assists UDS in tracking SEP equipment and ensures gear is returned to NDC upon departure of divers from unit.

2.7.3 Qualifications.

A. Divemaster.
   1) Be a current or former NOAA certified diver unless otherwise authorized by the LODO/SODO;
   2) Complete the NOAA DM training program;
   3) Be assigned by the UDS; and

4) Must be current in CPR, including adult AED, first aid and oxygen administration and be knowledgeable in dive accident management.

B. Lead Diver.
   1) Be a current NOAA certified diver;
   2) Be approved by the UDS or designee after demonstrating the ability to properly plan and safely execute dive operations; and
   3) Must be current in CPR, first aid and oxygen administration, and be knowledgeable in dive accident management.

2.8 Ship Diving Officer

2.8.1 General.

A. A ship Diving Officer is a designated crewmember of a NOAA ship who serves as the primary communicator between NDP and the ship.
B. Ensures NDP and ship's Command understand each other's needs and requirements.
C. Does not plan or supervise dive operations unless currently certified as a DM by the NDP.
D. Reports to an assigned OMAO UDS in the diving chain of command.

2.8.2 Responsibilities.

A. Administers NDP policies onboard as delegated by the assigned shore-based UDS;
B. Monitors dive roster and informs Command of issues affecting operational readiness (e.g., such as lapsing proficiency, expiring certification, training requirements, and personnel shortages);
C. Prepares, or delegates to the diver candidate, diver training applications and submits them to NDC;
D. Maintains the ship's dive operations manual and other NDP-required documents, including personnel training records, air compressor maintenance records, and this manual;
E. Conducts semi-annual air compressor testing in accordance with the NDP TRI-Air testing Program;
F. Submits report of unit diving activities for the preceding fiscal year to the SODO by October 15th of each year; and
G. Conducts an annual dive locker inspection and submits report to their respective UDS by January 15th of each year.

2.8.3 Qualifications.

A. May be any crewmember duly appointed by the Commanding Officer;
B. Must have good organizational and communication skills;
C. Should receive and give thorough instructions when rotating and/or reassigning shipboard duties; and

2.9 Designated Person-in-Charge

2.9.1 General.

A. A Designated Person-in-Charge (DPIC) is an individual, designated by the DM or UDS to be at the dive location in charge of all aspects of the diving operation affecting the safety and health of dive team members.

B. DPICs are required whenever working dives are performed and shall remain on the surface at the dive location throughout the entire dive operation.

2.9.2 Qualifications.

A. Must be current in CPR, first aid and oxygen administration, and be knowledgeable in dive accident management;
B. Shall have experience and training in the conduct of the assigned operation and be familiar with the work being performed underwater;
C. Must be ready, willing, and able to render assistance in an emergency;
D. The DPIC shall be the DM or LD unless the DM or LD is diving; and
E. If the DM or LD is diving, the Standby Diver may be the DPIC; however, in the event of an emergency in which the Standby Diver is deployed, it is required to have another qualified DPIC topside.

2.10 NOAA Working, Advanced Working and Master Divers

2.10.1 General. NOAA divers are assigned throughout the agency to conduct working dives in support of NOAA's mission and in accordance with 29 CFR 1910, Subpart T.

2.10.2 Eligibility.

A. NOAA federal employees (e.g., General Schedule, Commerce Alternative Pay System, NOAA Corps Officers, Wage Grade, and Wage Marine);
B. NOAA contractors while directly under contract with NOAA for diving-related services;
C. Employees of Government agencies with whom NOAA has established Memorandums of Understanding, or similar agreements, for the purposes of diving; and
D. Volunteers (Section 2.14).

2.10.3 Responsibilities.

A. Adheres to the standards contained within this manual when conducting working dives.
B. Refuses to dive when in their judgment conditions are unsafe, or if they would be violating the precepts of their training or the requirements in this manual.
C. Maintains good physical condition and a high level of diving proficiency.
D. Reports to the DM or LD any changes of a physical or psychological nature that may adversely impact their or their buddy's fitness to dive.
E. Will not begin or continue a dive if problems exist of a physical or psychological nature that can compromise the safety of the diver or dive team.
F. Ensures diving equipment used is maintained in a safe operating condition.
G. Is accountable for NOAA-issued equipment.
H. Adheres to the buddy system, actively monitors buddy status including, but not limited to, cylinder pressure, and intervenes to the maximum extent practicable to ensure the safety of the dive team.
I. Refrains from the use of illegal drugs.

2.10.4 Qualifications.

A. Working Divers shall:
   1) Be SCUBA diving certified by a nationally or internationally-recognized diving agency above the basic entry level;
   2) Be currently certified in CPR, including automated external defibrillators (AEDs), and first aid (American Heart Association, American Red Cross, or equivalent);

3) Be certified in oxygen administration by the Divers Alert Network (DAN), NOAA, or other NOAA-approved agency;
4) Have completed a minimum of 25 logged dives;
5) Successfully complete a NOAA diving physical examination as outlined in Section 8, and be cleared to dive by the NDP DMO;
6) Successfully pass the NOAA swim test;
7) Successfully complete the NOAA Working Diver Training Course as outlined in Section 4 or equivalent (Section 3.2) as determined by the NDCSB. The NDCSB may waive the requirement to complete the NOAA Working Diver Training Course if in the NDCSB's judgment the individual possesses diving skills and experience equivalent to those of NOAA divers (Section 3.1);
8) Submit to voluntary drug testing (Section 3.1.5); and
9) Sign a Statement of Agreement.

B. Advanced Working Divers, in addition to requirements listed above, shall:
1) Complete a minimum of 150 logged dives as a NOAA Working Diver;
2) Successfully complete a NOAA DM course;
3) Complete two or more checkout dives with UDS;
4) Have obtained experience in a variety of diving conditions and demonstrated competent supervision of a range of diving operations; and
5) Receive certification based upon review of the candidate's dive resume by the divers' UDS, LODO/SODO, and the NDPM.

C. Master Divers, in addition to requirements listed above, shall:
1) Be certified as an Advanced Working Diver;
2) Complete a minimum of 150 logged dives as an Advanced Working Diver;
3) Possess special expertise in several areas of diving; and
4) Receive certification based upon review of the candidate's dive resume by the divers' UDS and LODO/SODO as well as one other LODO/SODO, and by the NDPM.

2.10.5 Equipment. Unless otherwise authorized by the LODO/SODO, Working, Advanced Working, and Master Divers shall be outfitted with SEP equipment per Section 7.3.1.

2.10.6 Equivalency (Section 3.2).

2.11 Temporary Working Divers

2.11.1 General.

A. Occasionally there may be situations where highly qualified, non-NOAA divers could significantly contribute to a dive project, but:
1) Are not currently certified as a NOAA Working Diver; or
2) Due to the limited extent of the project, full NOAA diver certification would not be reasonable or appropriate.

B. Temporary Working Divers are eligible to participate in NOAA-sponsored dive operations for a specific project or limited period of time.

C. The NDCSB will ultimately determine:
1) Which candidates meet the requirements for Temporary Working Diver certification; and
2) Any limitations imposed on the divers.

D. Temporary Working Divers diving under NOAA auspices shall follow the standards outlined in this manual unless authorized by the NDCSB.

2.11.2 Medical Requirements. Candidates must successfully complete a medical examination in accordance with the standards outlined in the NOAA Diving Medical Standards and Procedures Manual.

2.11.3 Minimum Requirements.

A. Proof of training and/or experience equivalent to that of a NOAA Working Diver as determined by the NDCSB;
B. Current certification in CPR, including adult AED, first aid, and oxygen administration (American Heart Association, American Red Cross, or equivalent);
C. Successful completion of a swim test and open-water checkout dive equivalent to that required for NOAA divers;
D. Successful completion of the NOAA Diving Regulations, Policies, and Procedures lesson found on the NDC website www.ndc.noaa.gov;
E. A minimum of 100 logged dives with at least 12 dives in the past year;
F. Successful completion of applicable NOAA specialized training (e.g., Diving Unlimited International (DUI) Weight and Trim System, Reserve Air Supply System (RASS), Line-tended Standby Diver) as deemed appropriate by the NDCSB;
G. Submit to voluntary drug testing (Section 3.1.5); and
H. Approval of the NDCSB.

2.11.4 Limitations.

A. Temporary Working Diver certifications are valid for up to 6 months as determined by the NDCSB and may be extended for one additional 6-month period.
B. Maximum depth and tasks authorized will be based on review of the divers' resumes and dive logs.

2.11.5 Equipment. With LODO/SODO and work supervisor's approval, Temporary Working Divers may be outfitted with SEP equipment per Section 7.3.1.

2.12 Observer Divers

2.12.1 General.

A. NOAA program sites are frequently visited by representatives of other agencies, the media, and various officials for the purpose of familiarization, evaluation, or reporting on NOAA programs.
B. The NOAA Observer Diver classification was established to allow divers to observe diving activities conducted by NOAA.
C. Observer Divers diving under NOAA auspices on working dives shall follow the standards outlined in this manual.
D. Once authorized, participation of Observer Divers shall be solely at the discretion of the on-site diving supervisor (e.g., UDS, DM or LD).

2.12.2 Eligibility.

A. The Observer Diver classification is open to both NOAA and non-NOAA personnel.

B. This classification does not apply to NOAA employees who dive as part of their regular duties or to NOAA employees who have been determined to be medically unqualified to dive.

2.12.3 Minimum Requirements.

A. Persons seeking authority to participate as an Observer Diver must provide the following documents to the appropriate UDS:
   1) Evidence of diving certification from a recognized diver certifying organization (e.g., National Association of Underwater Instructors (NAUI), Professional Association of Diving Instructors (PADI), or the military);
   2) Evidence of 10 logged dives, one of which has been conducted within the previous 3 months, indicating the appropriate proficiencies required for the diving conditions likely to be encountered; and
   3) Applicants must:
      a) Complete the NDP Observer Diver Medical History Report form and submit it directly to the NDP DMO for evaluation and approval; and
      b) Sign the Assumption of Risk and Release of Liability for Guests and Observer Divers Diving with the NOAA form.

B. The NOAA UDS or designee shall:
   1) Inspect diver's credentials and determines whether they have presented evidence establishing certifications by approved organizations;
   2) Use NOAA Form 56-62, NOAA Observer Diver Report, to obtain a signed liability release from the diver and complete the checklist portion;
   3) Inspect diver's gear for proper operating condition and require replacement of items not considered serviceable;
   4) Review diver's equipment maintenance records and verify the equipment has been serviced within the previous 12 months;
   5) Obtain approval from the LODO/SODO;
   6) Upon receiving clearance, conduct in-water evaluations of observer candidates to determine if current and overall experience levels, fitness, and diving proficiencies are adequate for the conditions likely to be encountered on the dives; and
   7) Complete the dive log of NOAA Form 56-62, NOAA Observer Diver Report, immediately following the diving operation and forward to the NDC.

C. The LODO/SODO shall:
   1) Receive a request from the UDS;
   2) Receive medical clearance from NDP DMO;
   3) Make the final decision on whether to authorize; and
   4) Inform the UDS of the decision.

2.12.4 Limitations.

A. Tasks of Observer Divers are limited to observation, photography, and/or videography.
B. Observer Divers may participate in up to 6 dives a year unless otherwise authorized by the LODO/SODO.

2.12.5 Manning Requirements.

A. Escort Divers.
   1) Observer Divers must be accompanied by a minimum of 2 UDS-approved authorized NOAA divers whose sole responsibilities are to monitor the observer in order to ensure his/her safety;
   2) A buddy team of NOAA escort divers may accompany up to 2 observer divers; and

3) Additional observer divers require additional NOAA escort divers in a ratio of one-to-one (see table below).

B. Standby Divers. A team of standby divers, or a line-tended standby diver, shall be available topside and ready to enter the water within 1 minute of notification.

C. Designated Person In-Charge. A DPIC who is assigned by the DM or LD and stationed topside at the dive location, shall be in charge of all aspects of the dive operation affecting the safety and health of the dive team members.

Observer Divers	Escort Divers	Standby Divers[1]	DPIC
1	2	1 or 2	1
2	2	1 or 2	1
3	3	1 or 2	1
4	4	1 or 2	1

[1] See 2.12.5 B above.

2.12.6 Equipment.

A. Unless otherwise authorized by the LODO/SODO, Observer Divers shall be outfitted with personally-supplied diving equipment equivalent to that of Section 7.3.1.

B. Each escort diver shall carry a RASS.

2.13 Reciprocity Working Divers

2.13.1 General.

A. Non-NOAA divers may participate in NOAA diving activities, and NOAA divers may participate in non-NOAA diving activities through reciprocity agreements.

B. Reciprocity Working Divers diving under NOAA auspices shall follow the standards outlined in this manual unless authorized by the NDCSB.

C. NOAA reciprocity agreements:

1) Allow non-NOAA divers to participate in NOAA diving activities, and vice-versa, with minimal administrative requirements;

2) Are established with other organizations only after it is determined that their diving programs are equivalent to NOAA's;

3) Are only applicable to personnel employed and covered for medical treatment and Workers Compensation by reciprocity organizations;

4) Are not transferable to other agencies or institutions with whom NOAA's reciprocity partners have separate reciprocity agreements with; and

5) Expire on December 31 of the year in which they were established. They must be re-established annually.

D. Reciprocity divers in good standing with their organizations who are not employees (e.g., students) and are not covered for medical treatment and Workers Compensation can only be accepted as volunteers if permitted by statutory authority (Section 2.14).

2.13.2 Request for Reciprocity with a Non-NOAA Organization.

A. A NOAA UDS may request formal diving reciprocity be established with non-NOAA organizations when no such agreement exists.

B. Such requests, along with a copy of the candidate organization's diving standards and safety manual, must be forwarded through the appropriate LODO/SODO to the NDCSB for review.

C. If deemed equivalent to NOAA's diving standards, reciprocity may be established for the current calendar year.
D. Reciprocity agreements are reviewed at the end of the calendar year and may be renewed at the request of the sponsoring UDS.
E. A list of current reciprocity agreements is maintained on the website at www.ndc.noaa.gov.

2.13.3 Letters of Reciprocity for NOAA Divers.

A. Per the terms of the reciprocity agreements, any NOAA certified diver wanting to dive with a reciprocity organization must request a LOR be sent from the NDPM to the NDSO of the receiving organization verifying they are an authorized NOAA Diver. In exigent circumstances, the UDS may issue a LOR but must notify the NDPM within 24 hours.
B. The NDP LOR Request Form, available on the NDC website, must be completed and sent to the NDC Secretary for processing.
C. LORs are generated by the NDC Secretary, signed by the NDPM and forwarded to the receiving DSO with a copy to the NOAA diver.
D. LORs will only be sent if the NOAA diver is in an authorized diving status requiring the following:
    1) Dive proficiency (a minimum of three (3) dives per quarter);
    2) Approved dive physical (per age-based requirements); and
    3) Medical Training (CPR, first aid, and oxygen administration)
E. Liability information.
    1) LORs for NOAA federal full-time employees will state the diver is covered under the Federal Employee Compensation Act, U.S. Code (USC) 5 USC § 8101 *et seq*., for injuries that may be sustained as the result of an accident occurring during the scope of any official dive, as well as by the provisions of the Federal Tort Claims Act, 28 USC §§ 1346, 2671 *et seq*.; and
    2) LORs for NOAA contract employees will state the diver is not a federal employee and, therefore, not covered by NOAA for injuries that may be sustained as the result of an accident occurring during the scope of any official dive.
F. LORs only address a diver's credentials and status within the NDP; it is up to the LO Program Office to which the diver belongs to determine if the specific work to be performed with a reciprocity partner is authorized from a programmatic standpoint.

2.13.4 Letters of Reciprocity for Non-NOAA Divers.

A. Reciprocity divers wanting to dive with NOAA must present a signed LOR from their organization's DSO to the appropriate UDS, or designee, verifying that the diver is in an authorized status with their organization.
B. Must indicate the diver is covered for medical treatment and covered under their organization's Workers Compensation policy.
C. Must be received from the DSO at an institution with whom NOAA has reciprocity.
D. Must meet the NOAA diving proficiency requirements (i.e., 3 dives during previous quarter).

2.13.5 Equipment.

A. Unless otherwise authorized by the LODO/SODO, Reciprocity Working Divers shall be outfitted with personally-supplied diving equipment equivalent to that of Section 7.3.1.
B. A UDS shall inspect the Reciprocity Working Diver's non-NOAA diving equipment for proper operating condition and replace items not considered serviceable with other equipment provided by the diver or NOAA.
C. When not provided by the Reciprocity Working Diver and with verification of the appropriate training, NOAA shall provide a diver-carried reserve breathing gas supply to the diver.

2.14 Volunteer Working Divers

2.14.1 General.

A. The Federal Government may only accept voluntary services as provided for by statute. Two laws that allow NOAA to accept volunteer services for certain activities are the Fish and Wildlife Improvement Act of 1978, 16 USC 742f, and the National Marine Sanctuary Act, 16 USC 1442.
B. The Fish and Wildlife Improvement Act authorizes Secretaries of the Interior and Commerce (inclusive of NOAA) to recruit, train, and accept the services of volunteer workers for or in aid of programs related to fish and wildlife programs or activities. The Act also authorizes provision of incidental expenses such as transportation, lodging, awards, and subsistence to volunteers without regard to their place of residence.
C. The National Marine Sanctuaries Act states that NOAA may accept donations of funds, property, and services for use in designating and administering National Marine Sanctuaries.
D. NOAA Volunteer Divers conducting approved diving work authorized by the Fish and Wildlife Act, as amended, or the National Marine Sanctuaries Act, as amended, or other applicable statutes will in most circumstances be considered federal employees for purposes of claims under the Federal Tort Claims Act and for purposes of the Federal Employees' Compensation Act.
E. Volunteers must submit proof of training and experience to the appropriate NOAA UDS for review. The UDS shall forward documentation, along with his/her recommendation, to their LODO/SODO. The LODO/SODO shall forward documentation, along with his/her recommendation, to the NDPM. The NDPM will review the documentation and recommendations from the UDS and LODO/SODO and render a decision. The NDPM shall notify the LODO/SODO and UDS of his/her decision.

2.14.2 Eligibility.

A. NOAA Volunteer Working Divers must be sponsored by a NOAA program or office. An appointing officer from that program or office is responsible for meeting all federal requirements of administering and managing the work of the volunteer and serves as the point of contact to the NDPM.
B. Divers in good standing with organizations with whom NOAA has an active Reciprocity Agreement for diving, and who meet the requirements of Section 2.13.4, may be accepted as volunteers based on their diving credentials as reciprocity divers.
C. Individuals not meeting the above requirement must comply with all diving regulations, policies, and procedures prescribed in the NWDSSM for NOAA certified divers.

2.14.3 Authority for Accepting Volunteers.

A. Authority for accepting volunteers for liability rests with the specific NOAA office/program hiring official receiving the services of the volunteer.
B. Final authority for certifying volunteers as NOAA divers rests with the NDPM.

2.14.4 Minimum Requirements.

A. Successful completion of a medical examination equivalent to those standards outlined in the NOAA Diving Medical Standards and Procedures Manual;
B. Proof of training and/or experience equivalent to that of a NOAA Diver as determined by the NDCSB and verified by the UDS. A minimum of 100 logged dives is required;
C. Current CPR, first aid, and oxygen administration certifications (American Heart Association, American Red Cross, or equivalent) and verified by the UDS;
D. Successful completion of a written test of knowledge as determined by the NDCSB and verified by the UDS or designee;
E. Successful completion of the NOAA swim test (Section 3.1.3) and an open-water checkout dive equivalent to that required for NOAA Divers and conducted by the UDS, or designee;
F. Successful completion of applicable NOAA specialized training (e.g., DUI Weight and Trim System, RASS, Line-tended Standby Diver) verified by UDS;
G. Submit to voluntary drug testing (Section 3.1.5); and
H. Approval of the NDPM.

2.14.5 Limitations.

A. Maximum depth and tasks authorized may be limited by the UDS, LODO/SODO, or the NDPM based on review of the divers' resumes and dive logs.
B. Unless approved by the UDS, Volunteer Working Divers shall be directly supervised by an on-site NOAA DM or LD. If no DM or LD are available, the UDS may assign supervisory responsibility to another NOAA employee, but only if the individual is knowledgeable in the diving activities being conducted and is ready, willing, and able to render assistance in an emergency.
C. Must be at least 18 years of age.

2.14.6 Equipment.

A. Unless otherwise authorized by the UDS, Volunteer Working Divers shall be outfitted with their own diving equipment equivalent to that of NOAA divers, and annual service records will be provided to the UDS for review annually. The responsibility for any lost or damaged volunteer-owned diving gear or equipment rests with the sponsoring program or office.
B. When not provided by the Volunteer Diver, and with verification of appropriate training, NOAA shall provide (when required) the diver with a diver-carried RASS to be used while performing official NOAA dives.

2.14.7 Responsibilities.

A. NOAA Appointing Officer.
    1) Reviews and approves all requests for Volunteer Working Divers from a NOAA office/program perspective; and
    2) Signs all required volunteer forms acknowledging approval and acceptance of liability for the volunteer while providing volunteer service to the NOAA office/program.
B. Volunteer Diver.

1) Adheres to the standards contained within this manual when conducting working dives;
2) Refuses to dive when in their judgment, conditions are unsafe, or if they would be violating the precepts of their training or the requirements in this manual;
3) Maintains good physical condition and a high level of diving proficiency;
4) Reports to the DM or LD any changes of a physical or psychological nature that may adversely impact their or their buddy's fitness to dive;
5) Will not begin or continue a dive if problems exist of a physical or psychological nature that can compromise the safety of the diver or dive team;
6) Ensures diving equipment used is maintained in a safe operating condition;
7) Adheres to the buddy system, actively monitors buddy status, including, but not limited to, cylinder pressure, and intervenes to the maximum extent practicable to ensure the safety of the dive team; and
8) Refrains from the use of illegal drugs.

C. NOAA Unit Diving Supervisor.
1) Reviews documentation from the applicant for compliance with minimum requirements;
2) Inspects Volunteer Working Divers' equipment for proper operating condition, reviews maintenance records, and replaces items not considered serviceable with other equipment provided by the diver or with NOAA equipment;
3) Administers the written examination and conducts or delegates authority to conduct, checkout dive;
4) Forwards documentation to LODO/SODO along with recommendation; and
5) Approves individuals to supervise volunteer diving activities.

D. NOAA LODO/SODO. Reviews documentation and recommendation from the UDS and forwards to the NDPM along with recommendation within 10 days.

E. NOAA Diving Program Manager.
1) Reviews documentation and recommendation from the UDS, and LODO/SODO and makes final decision on acceptance of candidate.
2) Reports decision to LODO/SODO and UDS in writing within 10 days of receipt of package from LODO/SODO.

2.15 Special Task Endorsement

2.15.1 General.

A. NOAA scientific divers may apply for a Special Task Endorsement (STE) for one or more specific working diver tasks (e.g., use of lift bags to move >100 lbs. underwater) to UDSs.

B. Such requests must include a rationale/justification for the endorsement, a detailed outline of the training to be conducted including, but not limited to, the number of hours of classroom and practical instruction, location, and number of training dives to be performed, topside and underwater skills to be performed, and the name and credentials of instructors involved in the training.

2.15.2 Responsibilities.

A. NOAA UDS. Shall review the request and, if deemed complete and appropriate, forward it with a recommendation to the appropriate LODO/SODO for review and approval.

B. NOAA LODO/SODO. Shall forward a request, if approved, to the NOAA NDPM for issuance of the STE.
C. NOAA NDPM. Shall add the endorsement to the diver's letter of authorization to dive and forward a copy of the letter to the diver, UDS, and LODO/SODO.

2.15.3 Limitations.

A. STEs are valid for 12 consecutive months from the date of award and may be renewed at the discretion of the UDS and LODO/SODO. Divers interested in renewing their STE shall submit a request through their UDS to their LODO/SODO, listing the number and types of STE dives performed during the previous award period. The UDS shall review the request and, if deemed complete and appropriate, forward it with a recommendation to the appropriate LODO/SODO for review and approval.
B. Once awarded, STE divers are expected to perform the specific task(s) for which the STE was granted at least twice a year. Failure to do so may result in the temporary suspension or revocation of the STE as determined by the LODO/SODO, or his designee.
C. Tasks associated with STEs cannot be conducted as scientific dives under the provisions outlined in 29 CFR 1910.401(a)(2)(iv) and, therefore, must be conducted as "working dives" per 29 CRF1910, Subpart T, and this manual.

2.16 NOAA Diving Medical Officer

2.16.1 Definition. A NOAA Diving Medical Officer (NDMO) is a health care provider with specialized training in diving and hyperbaric medicine capable of recognizing and providing medical services and/or advice for diving related injuries.

2.16.2 Qualifications.

A. Be a licensed health care provider (i.e., physician (MD/DO), a nurse practitioner (NP), or physician's assistant (PA) assigned to NOAA; and
B. Complete a NOAA-recognized DMO course approved by the Chair, NOAA Diving Medical Review Board (NDMRB) (e.g., NOAA/Undersea and Hyperbaric Medical Society (UHMS) Physicians' Diving Medicine course, U.S. Navy's Recognition and Treatment of Diving Injuries course).
C. In addition, the DMO stationed at the NDC will hold and maintain a NOAA diving certification.

2.16.3 Responsibilities.

A. Maintain current education in the area of dive medicine;
B. Conduct reviews of dive physicals and other medical submissions;
C. Make determinations of medical fitness to dive;
D. Serve as an advisor to the NDPM regarding medical issues;
E. Provide medical services and advice in support of diving operations;
F. Provide medical training;
G. Serve as a liaison between the civilian dive medicine community and NDC;
H. Serve as Chairperson of the NDMRB and advisor on the NDCSB as appointed by the OMAO Director; and
I. Confer with NDMRB as needed to resolve fitness to dive and other dive medicine issues.

2.17 NOAA Diving Medical Review Board

2.17.1 General.

A. The NOAA Diving Medical Review Board (NDMRB) is a standing committee of a minimum of 5 qualified hyperbaric physicians that advises the NDP on various diving-related medical issues.
B. Members of the NDMRB are appointed by the OMAO Director after consultation with the NDPM and the Chair, NDMRB.
C. The NDP DMO shall serve as the Chair, NDMRB.
D. Appointments to the NDMRB are for a period of 5 years and may be extended by the OMAO Director after consultation with the NDPM, and the Chair, NDMRB.
E. The NDMRB shall not provide advice as a group, but rather, all advice is forwarded by individual members to the Chair, NDMRB.

2.17.2 Responsibilities.

A. Chair.
   1) Receives general program policy guidance, excluding medical guidance, from the NDPM;
   2) Consults with medical experts on medical-related issues for consideration by the NDMRB when requested or otherwise deemed necessary;
   3) Summarizes all input from the NDMRB and reports findings and recommendations to the NDPM; and
   4) Seeks consultation from an undersea or hyperbaric physician before a decision is rendered when circumstances or the situation does not allow for input from the membership of the NDMRB and the Chair is not a physician.
B. NDMRB Members.
   1) Recommend medical policy and changes in medical operating procedures that will foster a safer and more efficient diving program;
   2) Review divers' medical qualifications forwarded by the NDP DMO to assess application of the NDP's medical evaluation criteria or other issues raised by the NDPM, or Chair, NDMRB;
   3) Review appeals from divers who are medically disqualified from diving and provide medical opinions and recommendations to the Chair; and
   4) Provide medical reviews of diving incidents as requested by the Chair, NDMRB.

2.17.3 Qualifications.

A. Chair.
   1) Federal employee or a member of a uniformed service;
   2) NOAA certified SCUBA diver;
   3) Complete a NOAA-approved DMO course; and
   4) Must be a physician (MD/DO), NP, or PA.
B. NDMRB members.
   1) Complete a NOAA-approved DMO course; and
   2) Be a physician with expertise in undersea or hyperbaric medicine.

2.18 NOAA Diving Technical Advisory Committee

2.18.1 General.

A. The NOAA Diving Technical Advisory Committee is a standing committee of individuals outside of the agency with varying backgrounds and specialties in diving that advises the NDP on various operational and technical issues.
B. Members of the committee are appointed by the NDCSB.
C. The committee shall not provide advice as a group, but rather, all advice is forwarded by individual members to the Chair, NDCSB, through the NDPM.

2.18.2 Responsibilities.

A. Reviews unique or specialized diving projects, equipment, and techniques and provides comments on their safety and feasibility to the NDCSB; and
B. Provides comments to the NDCSB on proposed new diving equipment, regulations, policies and procedures affecting the NDP.

2.18.3 Qualifications. Possess specialized knowledge or experience in diving.

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SECTION 3: WORKING DIVER CERTIFICATION

3.1 Initial Certification Requirements

3.1.1 Qualifications. Candidates must provide documented evidence of completion of the qualifications identified in Section 2.10.

3.1.2 Medical Clearance.

A. All NOAA divers must successfully pass a NOAA diving physical examination prior to beginning the NOAA Working Diver certification process.
B. Specific physical examination requirements are briefly described in Section 8 and covered in detail in the NOAA Diving Medical Standards and Procedures Manual which can be viewed and downloaded from the NDC website at www.ndc.noaa.gov.
C. Physical exams must be completed by a credentialed provider (must be a MD, Doctor of Osteopathic Medicine (DO), NP, or PA), preferably with hyperbaric training.
D. All physical exams shall be submitted directly to and approved by the NDP DMO.

3.1.3 Swim Test.

A. General.
   1) All NOAA diver candidates must successfully pass the NOAA Swim Test prior to undergoing initial NOAA Working Diver certification; and
   2) All swim test skills are to be completed in one pool session and without the use of swimming aids (i.e., mask, fins, snorkel, or flotation devices).
B. NOAA Swim Test requirements include:
   1) Swim 550 yards (500 meters) on the surface without stopping in under 15 minutes;
   2) Swim 25 yards (22 meters) underwater without surfacing and without pushing off from the wall of the pool; and
   3) Tread water for 30 minutes without any flotation aids.

3.1.4 Open-Water Evaluation and Checkout Dive.

A. General.
   1) All candidates for NOAA Working Diver certification must demonstrate minimum dive proficiency skills in an open-water environment; and
   2) Candidates meeting the requirements outlined in Sections 3.1.1 through 3.1.3 are eligible to undergo a checkout dive with a UDS or designee.
B. Requirement. The specific skills to be demonstrated during the checkout dive are listed on the NOAA Diving and Rescue Skills Checkout Report (Appendix 6).

3.1.5 Voluntary Drug Testing.

A. The use of illegal drugs can dramatically affect the physical and mental condition of divers, which in turn can affect their abilities to make sound decisions underwater.
B. As a condition for becoming a NOAA Diver, individuals not already in testing designated positions must:
   1) Submit to a voluntary drug test, and
   2) Volunteer for unannounced random testing in accordance with the U.S. Department of Commerce (DOC) Drug Free Workplace Plan and Guide.
C. A verified positive drug test for any individual for which diving is included in their position descriptions may result in denial of initial employment or, if already employed, termination of employment.

D. A verified positive drug test for any employees for which diving is not included in their position descriptions will result in denial of initial diving certification or, if already certified to dive, termination of NOAA diving privileges.
E. Specific information on the drug testing program is outlined in the DOC Drug-Free Workplace Plan and the DOC Drug and Alcohol-Free Workplace Testing Guide; both can be downloaded at hr.commerce.gov.

3.2 Recognition of Equivalent Certifications

3.2.1 General.
A. The NDCSB may accept non-NOAA dive certifications if it is determined that the certification is equivalent to or greater than NOAA certification.
B. The NDCSB shall ultimately determine equivalency of non-NOAA dive certifications (e.g., commercial or military dive training and experience) towards meeting NOAA requirements.

3.2.2 Requirements.
A. Meet requirements outlined in Section 3.1;
B. Pass a written examination;
C. Complete NOAA-specific training as determined by the NDCSB; and
D. Complete skills check out (Open Water Evaluation, Section 4.1.4C) with the UDS or designee.

3.3 Depth Limitations

3.3.1 Initial Limitation. Although the nominal depth to which NOAA divers are certified is 130 fsw, all newly certified NOAA divers shall be limited to a maximum depth of 60 fsw until approved to dive deeper by the UDS.

3.3.2 Certification to Dive Deeper than130 fsw.
A. A diver holding a 130 fsw certificate may be certified to a depth greater than 130 fsw after successfully completing a NDCSB-approved deep-diving training program.
B. Working dives conducted deeper than 100 fsw require access to a hyperbaric chamber within 5 minutes of the dive location.
C. Working dives requiring in-water decompression must be pre-approved by the NDCSB and require access to a hyperbaric chamber within 5 minutes of the dive location.

3.3.3 Advanced Working Tasks. Tasks involving the use of power tools, lifting or moving heavy objects, or requiring substantial physical exertion must be successfully demonstrated in shallow water (e.g., <60 feet) before attempting the same skills in deeper water.

3.4 Maintaining Certification

3.4.1 General. In order to maintain active dive status, NOAA Working, Advanced Working, and Master Divers must complete the requirements outlined below. Failure to do so may result in temporary suspension of diving privileges.

3.4.2 Dive Proficiency Requirements.

A. In order to maintain dive certification, NOAA divers must log a minimum of three (3) dives during each quarter of the calendar year.
B. Training and proficiency dives conducted by employees and contract, reciprocity, and volunteer divers undertaken in the furtherance of science may be conducted per standards outlined in the NOAA Scientific Diving Standards and Safety Manual provided the requirements for the scientific exemption outlined in 29 CFR § 1910.401(a)(2)(iv) are met.
C. Scientific training and proficiency dives are not required to comply with the commercial dive standards at 29 CFR § 1910 *et seq*. provided the dives are not combined with any element comprising a working or commercial dive.
D. NOAA UDSs or designees are responsible for determining whether a dive can be performed under the OSHA Scientific Exemption (29 CFR § 1910.410(a)(2)(iv)) based on review of the dive plan. Procedures associated with this responsibility are outlined in Section 1.1.2 of this manual.

3.4.3 Medical Standards (Section 8).

3.4.4 Emergency Care Training.

A. NOAA divers and DPICs must remain current in:
   1) Adult CPR, including AED;
   2) First Aid (American Red Cross, American Heart Association, or equivalent); and
   3) Oxygen administration, which shall be completed annually and may be accomplished by completing the NOAA on-line refresher course followed by hands-on practice.
B. Proof of above training shall be provided to the UDS or designee.

3.4.5 Annual Watermanship Assessment.

A. General.
   1) NOAA divers must pass the NOAA Diving Watermanship Assessment on an annual basis.
   2) Completion of this requirement is to be documented on the NDP Annual Watermanship Assessment form (available at www.ndc.noaa.gov) by the UDS, or designee, and filed on site.
   3) Failure to meet the minimum watermanship assessment standards, or submit the form by the deadline, is cause for temporary suspension from diving.
B. The minimum requirements are:
   1) Swim 550 yards (500 meters) without stopping using mask, fins and snorkel in less than 10 minutes; and
   2) If using a wetsuit covering any part of the torso, the test must be completed in less than 12 minutes.
C. Responsibilities.
   1) Divers. All NOAA divers must pass the NOAA Diving Watermanship Assessment on an annual basis.
   2) Unit Diving Supervisors.
      a. Monitor administration of the NOAA Diving Watermanship Assessment on an annual basis;
      b. Suspend diving authorization of assigned divers not passing the NOAA Diving Watermanship Assessment;

c. Advise the respective LODO/SODO of assigned divers who have not passed the NOAA Diving Watermanship Assessment; and
d. May delegate administration of the NOAA Diving Watermanship Assessment to Divemasters or lead divers.

3) NOAA Line or Staff Office Diving Officers. Advise the NDP Manager of assigned divers who have not passed the NOAA Diving Watermanship Assessment.
4) NOAA Diving Program Manager. Updates the on-line NOAA Dive Log to reflect the current diving status of all divers after notification by LODOs/SODO of assigned divers who have not passed the NOAA Diving Watermanship Assessment.

3.4.6 Physical Conditioning Training.

A. Diving is physically demanding and it is imperative that both divers and managers recognize the need for a continual and aggressive exercise program that exceeds basic health maintenance standards.
B. In order to help maintain appropriate fitness to dive, immediate supervisors may grant currently authorized NOAA divers up to 3 hours per week of official time to help maintain a conditioning level sufficient to pass the annual watermanship test.
C. A variety of activities including, but not limited to, swimming, jogging, cross country skiing, cycling, walking, weight training, etc., are acceptable for maintaining sufficient condition for individuals required to dive.

3.4.7 Voluntary Drug Testing (Section 3.1.5).

3.4.8 Annual Training Requirement.

A. General.
1) All NOAA divers shall undergo annual refresher training consisting of in-water skills and academic instruction.
2) Training shall be conducted over 2 separate days and documented in the Unit Training Log.
3) Failure to comply with the Annual Training Requirements shall result in suspension of diving privileges.

B. Requirements.
1) In-water Training. The UDS or designee will conduct a checkout dive with each diver to assess in-water rescue and basic diving skills, including the retrieval of an unconscious diver from the surface of the water to a vessel or shore.
a) Successful completion of skills is to be documented on the Rescue and Diving Skills Checkout Report (Appendix 6) by the UDS or designee.
b) Copies of the most recent checkout reports must be kept by the UDS or designee for each diver and noted on the Annual Unit Inspection Checklist.
2) Classroom Training. Complete academic instruction (self-study or instructor-lead) in the following topics:
a) Oxygen administration;
b) Recognition and treatment of diving accidents and injuries;
c) Five-minute neurological examination;
d) Rescue techniques;
e) Diving accident management;
f) NOAA Dive Tables for Multiple Air Dives; and
g) NOAA Diving Standards, Policies, and Procedures.

3.5 Recertification

3.5.1 General. Divers whose dive certifications have lapsed due to lack of activity shall be temporarily suspended pending the completion of a recertification program.

3.5.2 Requirements.

A. 3-6 month lapse in conducting a dive:
   1) If a diver does not complete a minimum of three (3) dives during a quarter, they must perform a training-only, basic checkout dive with the UDS or designee.
   2) Based on the diver's performance during the checkout dive, the UDS may require additional academic or practical training in order to recertify.
   3) Once the diver has met the recertification requirements prescribed by the UDS, the UDS will notify the NDC and the diver will be reauthorized to resume on-duty diving.

B. 6-12 month lapse in conducting a dive:
   1) If a diver does not complete the required number of dives for a period of 6-12 months, the LODO/SODO is responsible for reauthorization.
   2) Divers must complete a minimum of a training-only, basic checkout dive with the UDS or designee.
   3) NOAA Diving and Rescue Skills Checkout Report form (Appendix 6) must be completed.
   4) UDS shall forward a copy of the Skills Checkout Form and a recommendation to the LODO/SODO for consideration.
   5) LODO/SODO shall determine if the diver has met the recertification requirements and either authorize the diver to return to diving status or specify any additional requirements needed to reauthorize.
   6) Once the diver is cleared to return to diving, the LODO/SODO shall notify the NDC and the UDS that the diver may resume on-duty diving.

C. More than 12 month lapse. If a diver does not complete the required number of dives for a period of more than 12 months they must complete a refresher training program specified by the LODO/SODO.

3.6 Suspension and Revocation of Dive Certifications

3.6.1 General.

A. NOAA dive certifications may be temporarily suspended or permanently revoked for cause.
B. Temporary suspension of NOAA dive certification is typically issued for medical reasons or minor infractions of NOAA diving regulations, policies, or procedures.
C. Permanent revocation of dive certification is typically reserved for more serious conditions or violations of NOAA diving regulations, policies, or procedures.

3.6.2 Temporary Suspension.

A. Representative examples of situations and infractions leading to temporary suspension include, but are not limited to:
   1) Failure of a diver to maintain minimum diving proficiency on a recurring basis;
   2) A lapse of CPR, first aid, and/or oxygen administration;
   3) Failure to pass the Annual Watermanship Assessment;
   4) NDP DMO has concerns about findings on the Annual Medical Status Form;

5) Failure of a diver to pass a NOAA diving physical examination within the prescribed, age-based interval;
6) Failure of a diver to properly use or maintain NOAA-provided diving gear or support equipment;
7) Failure of a diver to comply with the policies and procedures of this manual;
8) Reporting to the dive station mentally or physically impaired due to alcohol or other substance abuse;
9) An injury or condition that requires medical treatment beyond basic first aid; and
10) Surfacing from a dive with less than 500 pounds per square inch (psi).

B. Dive certifications can be temporarily suspended for cause by the NDPM, LODO/SODO, UDS, or on-site DM.

3.6.3 Permanent Revocation.

A. Representative examples of situations and infractions leading to permanent revocation include, but are not limited to:
1) Flagrant violation of NOAA standards, regulations, and policies; (e.g., diving solo without a tender, diving after notification of a lapsed physical exam without obtaining reauthorization); or
2) A not-fit-for-dive duty determination has been made by the Chair, NDMRB, following the conclusion of an Individualized Assessment (See NOAA Diving Medical Standards and Procedures Manual).

B. Permanent revocation of dive certifications shall only be issued by the NDPM upon direction of the NDCSB.

3.6.4 Suspension or Revocation Appeal Process.

A. Suspended divers may appeal the decision to the NDCSB within 30 days of receipt of notification.
B. Terminated divers may appeal the decision to the OMAO Director within 30 days of receipt of notification.

SECTION 4: WORKING DIVER TRAINING

4.1 Course Requirements

4.1.1 General.

A. Students. Students in diving classes must meet the initial certification requirements outlined in Section 3.1.

B. Instructors.

1) NOAA dive instructors shall be experienced in the subject being taught and approved by the NDPM; and

2) NOAA instructors shall carry out their duties as directed by the NDPM or by the NOAA Diving Center Manager (NDCM) where appropriate.

4.1.2 Attendance.

A. Students are required to attend all training sessions.

B. Failure to attend all classroom sessions without prior approval of the Course Director may result in dismissal from the course.

4.1.3 Academic Material.

A. Minimum topics. Topics to be included in the Working Diver Course include, but may not be limited to the following:

1) Diving physics and physiology
2) Diving equipment
3) Decompression tables
4) Dive rescue and accident management
5) Air consumption calculations
6) Underwater work techniques and tools
7) Oxygen first aid
8) Hazardous Aquatic Animals
9) Dive regulations, standards, policies and procedures

B. Written Examinations.

1) Students must pass all written examinations with a minimum score of 80 percent.
2) Students not meeting the minimum requirements must take a make-up exam to continue in the class.
3) Students failing to score 80 percent on the make-up exam may be dismissed from the class.

4.1.4 Practical Skills.

A. General.

1) All students must successfully demonstrate proficiency in all required skills in order to pass NOAA dive training classes.
2) Students not meeting this requirement may be provided additional remedial instruction and opportunities to meet the requirements, or dismissed from the class.
3) Students dismissed from classes may repeat the class if approved by the NDCM after consultation with the NDPM.

B. At the completion of training, the trainee must satisfy the Course Director of their ability to perform the following in a pool or sheltered water:

1) Enter water with full equipment;
2) Clear face mask;

3) Demonstrate air sharing, including both buddy breathing, as donor and recipient, with and without mask, use of an alternate air delivery source, and use of a redundant air source system;
4) Demonstrate ability to alternate between snorkel and SCUBA while kicking;
5) Demonstrate understanding of underwater hand and light signals;
6) Demonstrate simulated in-water mouth-to-mouth resuscitation;
7) Rescue and transport, as a diver, a passive simulated victim of a diving accident;
8) Demonstrate ability to remove and replace equipment while submerged; and
9) Demonstrate watermanship ability, which is acceptable to the Course Director.

C. Open Water Evaluation.
1) Trainees must satisfy an instructor in their ability to demonstrate the following in open water:
a) Proficiency in air sharing as both donor and recipient;
b) Entering and exiting procedures to include shore, pier, and small boat while wearing SCUBA gear;
c) Ability to maneuver efficiently at and below the surface of the water;
d) Clearing of mask and regulator while submerged;
e) Ability to switch to a reserve alternate air source while submerged;
f) Regulator and weight-belt release and recovery while submerged;
g) Ability to achieve and maintain neutral buoyancy while submerged;
h) Techniques of buddy rescue;
i) Navigate underwater;
j) Adequate judgment for safe diving;
k) Plan and execute a dive; and
l) Proper use of underwater tools and techniques (e.g., lift bags, pinger locators, search patterns, item investigation, rigging).
2) Students should be exposed to open-water conditions while diving at night, and under conditions of reduced visibility.

4.1.5 Student to Instructor Ratios. On dives in which student divers are accompanied by an instructor, the following instructor to student ratios shall apply, unless approved otherwise by the NDPM or his designee:
A. Pool or similar environments: One (1) instructor per eight (8) students; and
B. Open-water: One (1) instructor per four (4) students.

4.1.6 Termination of Instruction.
A. Students may be dismissed from participation in a course by the Course Director for any of the following reasons:
1) Failure to attend class;
2) Failure to demonstrate minimum proficiency in one or more skills;
3) Failure to pass a written exam; or
4) Being disruptive in class or failing to follow instructions.
B. Students may voluntarily discontinue any training class for any reason at any time.

4.2 Other Requirements and Considerations

4.2.1 Support Boat.
A. Unless otherwise authorized by the Course Director, a support boat shall be in the water and standing by in case of emergency during all open-water training dives.

B. The boat shall be outfitted and operated per NAO 209-125 (NOAA Small Boat Regulations).

4.2.2 Standby Diver.

A. Unless otherwise authorized by the Course Director, a line-tended standby diver, or a standby buddy team shall be ready to enter the water in an emergency within 1 minute of notification by the DM for all training dives.
B. Standby divers must be approved by the Course Director.

4.2.3 Safety Requirements.

A. Students must successfully demonstrate proficiency with assigned skills in shallow water (e.g., <60 feet) before attempting the same skills in deeper water.
B. Unless otherwise approved by the Course Director, minimally experienced divers should:
   1) Be accompanied by an instructor for the first three (3) open-water dives; and
   2) Descend using a downline or fixed object (e.g., piling, naturally sloping bottom terrain) to help prevent ear barotrauma.
C. All training dives shall be logged in accordance with Section 10.1.5.

4.2.4 Student Health and Welfare.

A. Dive classes should be designed to allow students:
   1) A minimum of 8 hours of rest during each 24-hour period; and
   2) A minimum of 30 minutes surface interval between dives.
B. Instruction should be limited to 10 hours a day.
C. Dive students shall be:
   1) Encouraged to remain well hydrated during multi-dive, multi-day dive training;
   2) Instructed to refrain from pre-dive or post-dive physical exertion; and
   3) Instructed to immediately report any signs or symptoms of any diving-related maladies.

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SECTION 5: DIVING STANDARDS AND POLICIES

5.1 General

5.1.1 Diving Experience or Training.

A. Each dive team member shall have the experience or training necessary to perform assigned tasks in a safe and healthful manner.

B. Each dive-team member shall have experience or training in the following:

1) Use of tools, equipment and systems relevant to assigned tasks;
2) Techniques of the assigned diving mode; and
3) Diving operations and emergency procedures.

5.1.2 Specialized Diving Operations.

A. Diving projects involving diving equipment other than open-circuit SCUBA, breathing mixtures other than air, or decompression dive profiles must be pre-approved by the NDCSB.

B. Any NOAA diver interested in conducting a specialized diving project must submit a proposal through their UDS and LODO/SODO for consideration. Such plans include, but are not limited to, the following elements:

1) Overview of the operations;
2) Goals, objectives, and tasks to be accomplished;
3) Description and location of dive site;
4) Names, affiliations, roles/responsibilities, and qualifications of all participants;
5) Schedule of operations;
6) Description of equipment and facilities;
7) Logistical arrangements and considerations;
8) Normal and emergency diving procedures;
9) DEAP; and

C. Supporting documents, permits, and required forms.

5.1.3 Tasks Authorized.

A. NOAA Working Divers can perform tasks commensurate with their certification level.

B. Specialized training is required for tasks, equipment, techniques, and environments, including, but not limited to:

1) Tasks involving the use of:
   a) Hydraulic or pneumatic tools;
   b) Lift bags;
   c) Cutting torches;
   d) Towboard diving; and
   e) Air-lifts, water dredges.
2) Environments consisting of:
   a) Overhead obstructions;
   b) Blue-water;
   c) Restricted visibility;
   d) Currents greater than 1kt; and
   e) Water temperatures below 50 degrees (F).
3) Equipment including:
   a) Drysuits;
   b) Full-face masks;

c) Tethered SCUBA; and
d) Surface-supplied.

5.1.4 Restrictions.

A. Dive team members:
   1) Shall not engage in working diving operations under the auspices of the NDP unless they hold a current certification or specialized task endorsement for the type of tasks to be performed;
   2) Shall not be assigned tasks inconsistent with the individual's verifiable experience or training, except that limited additional tasks may be assigned to an individual undergoing training provided that these tasks are performed under the direct supervision of an experienced dive team member;
   3) Shall not perform advanced work-related skills in deep water until they have demonstrated these skills in shallow water (<60 fsw) to the satisfaction of the UDS or designee;
   4) Shall not be permitted to dive or otherwise exposed to hyperbaric conditions for the duration of any temporary physical impairment or condition that is known to NOAA and is likely to adversely affect the safety or health of a dive team member;
   5) Shall not be permitted to dive for the duration of any known medical condition, which is likely to adversely affect the safety and health of the diver or other dive team members;
   6) Shall not be exposed to hyperbaric conditions against their will, except when necessary to complete decompression or treatment procedures; and
   7) Who are exposed to or control the exposure of others to hyperbaric conditions shall be trained in diving-related physics and physiology.

B. Hours of Operation.
   1) Normal work schedule for personnel engaged in diving activities should not exceed 12 hours during any 24 hour period; and
   2) A minimum rest period of 8 continuous hours is required for all divers during each 24 hour period.

C. Consecutive Days of Diving.
   1) DM or LD in charge of the dive operations has full authority to institute a mandatory day of rest (i.e., 24 hours without diving or strenuous activity) for individual divers, or the entire dive team, if in his/her opinion, continued diving would compromise the safety of the divers.
   2) Unless approved otherwise by the DM or LD a mandatory day of rest will be instituted after 10 consecutive days of diving.

5.1.5 Participation in Non-NOAA Operations.

A. NOAA divers may participate in an official capacity in non-NOAA diving operations with agencies with which NOAA has established diving reciprocity agreements pending approval from their UDS, receipt of a letter of reciprocity from the NDC, and LO program authorization.

B. NOAA divers may also participate in an official capacity in non-NOAA diving operations with agencies without established diving reciprocity agreements with NOAA provided the divers comply with the NOAA diving regulations, policies and procedures specified in this manual, the operation is approved by the NDCSB and a Memorandum of Understanding has been established with the receiving organization by the NDPM.

5.1.6 Diver Responsibility.

A. It is the responsibility of the diver to terminate the dive, without fear of penalty, whenever they feel it is unsafe to continue the dive, unless to do so compromises the safety of another diver already in the water.

B. While the employer has ultimate responsibility for safety in the workplace, divers are responsible for their own safety and share responsibility for the safety of their buddy. Part of this responsibility is the requirement to refuse to dive if in the diver's judgment:
   1) Conditions are unsafe or unfavorable;
   2) They are not in good physical or mental condition for diving; or
   3) They would violate the dictates of their training or the NDP regulations, policies or procedures.

C. Divers are also responsible for:
   1) Reporting any signs or symptoms of diving maladies to the DPIC, Divemaster or Lead Diver;
   2) Reporting any unsafe acts that could jeopardize their or their fellow divers', health and safety; and
   3) Using and maintaining their NOAA-issued diving equipment properly.

5.1.7 Unit Inspections.

A. All NOAA diving units will conduct an annual self-inspection using the NDP Unit Diving Inspection Checklist which can be found at www.ndc.noaa.gov.

B. Periodically (frequency to be determined) NOAA diving units will also be inspected by the NOAA Diving Safety Officer, or his designee, as part of the Diving Unit Safety Assessment (DUSA) program.

C. It is anticipated that a DUSA inspection will include all unit specific applicable items listed in the NDP Unit Diving Inspection Checklist as well as an in-water evaluation of basic skills and rescue techniques.

D. Units found to be deficient may be suspended from diving by the NDSO, NDPM, or LODO/SODO until discrepancies are corrected.

5.1.8 Pay for Performing Dive Duties.

A. NAO 202-532A, Pay for Performing Dive Duties, establishes guidance for paying NOAA employees additional compensation for performing dive duties.

B. NOAA employees are entitled to receive hazardous duty pay for official dives performed.

5.2 Pre-Dive Requirements

5.2.1 General. The requirements outlined in this section shall be completed prior to each diving operation, unless otherwise specified.

5.2.2 Dive Planning and Approval.

A. A formal written dive plan shall be completed and submitted to the appropriate UDS, or designee, for approval and signature prior to each separate dive operation.

B. All dive planning shall be conducted in accordance with the NOAA Dive Operations Plan form (Appendix 3), which can be downloaded from the NDC website at www.ndc.noaa.gov.

C. If a dive operation is deemed “intensive,” as outlined in the NDP Dive Plan Review Policy Algorithm (Appendix 8), the UDS shall submit a copy of the dive plan to the LODO/SODO to determine the need for an on-site hyperbaric chamber.
D. The plan should be based on the skill level of the least experienced member of the dive team.
E. The UDS shall keep a copy of the dive plan on file for 24 hours after conclusion of the dive operation and shall provide a copy of the approved dive plan to the Divemaster or Lead Diver responsible for overseeing the dive.
F. All dives conducted during duty hours, must comply with the dive plan requirements.
G. Dive plans are required for each unique diving operation.
H. Multi-day operations with similar objectives, tasks and locations may be combined on one dive plan.
I. Minor changes in dive plans may be made on-site by the Divemaster or Lead Diver; however, any significant changes must be re-approved by the UDS or designee.
J. Once a dive plan is approved by the UDS, or designee, it is to be submitted electronically to ndp.diveplans@noaa.gov.

5.2.3 Diving Emergency Assistance Plan.

A. A DEAP must be submitted to the appropriate UDS, or designee, for review and approval on an annual basis or when the information on the DEAP changes (e.g., geographically or seasonally).
B. A DEAP is filed with a dive plan at ndp.diveplans@noaa.gov in accordance with the above.
C. All dive emergency assistance plans shall be prepared in accordance with the NOAA Diving Emergency Assistance Plan template (Appendix 4) which can be downloaded from the NDC website at www.ndc.noaa.gov.
D. Once approved, the plan shall be available to all divers and support personnel at the dive site.
E. The UDS shall keep the DEAP on file for the duration of the dive operation.
F. DEAPs can be for specific time frames or entire regions if there are no changes in chamber locations or means of evacuation.
G. A list shall be kept at the dive location of the telephone or call numbers of the following:
    1) The closest primary and secondary operational hyperbaric chambers and the available physician specialties (if not at the dive location);
    2) Accessible hospitals;
    3) NOAA-approved DMOs;
    4) Available means of transportation;
    5) Divers Alert Network (DAN); and
    6) The nearest U.S. Coast Guard Rescue Coordination Center.

5.2.4 Pre-Dive Safety Briefings.

A. Prior to any dive, a dive safety briefing shall be conducted by the Divemaster or Lead Diver.
B. At a minimum the briefing shall include:
    1) The tasks to be undertaken;
    2) Safety procedures and precautions for the diving mode;
    3) Any unusual hazards or environmental conditions likely to affect the safety of the diving operation;

4) Any modifications to operating procedures necessitated by the specific diving operation or conditions;
5) General goals and objectives;
6) Dive plan (maximum depth, maximum bottom time, and 500 psi ending cylinder pressure);
7) Entry and exit location and procedures;
8) Descent, on-bottom, and ascent procedures; and
9) Emergency and accident management procedures.

5.2.5 Pre-Dive Checklist.

A. A formal written pre- and post-dive checklist must be completed by the on-site Divemaster or Lead Diver for each diving day.
B. Use the NOAA Pre and Post Dive Checklist (Appendix 5), which can be downloaded from the NDC website at www.ndc.noaa.gov.
   1) The checklist includes a signature and date block that is to be completed by the individual completing the checklist.
   2) The checklist will be kept at the dive site or unit level for 24 hours following the dive, unless an incident has occurred in which case it will be kept indefinitely.

5.2.6 Fitness to Dive.

A. Prior to commencing dive operations, the Divemaster or Lead Diver shall:
   1) Assess each dive team member's current state of physical and mental readiness to dive and deny diving privileges to anyone deemed unfit to dive; and
   2) Inform the dive team members that physical problems or adverse physiological effects should be verbally reported to the Divemaster or Lead Diver.
B. Divers should refrain from alcohol consumption for a minimum of 12 hours prior to diving and 4 hours after diving.
C. Divers exhibiting any effects of alcohol or substance abuse shall not be permitted to dive and will have their diving certification temporarily suspended or permanently revoked from diving pending review by the NDCSB.

5.2.7 Emergency Equipment and Supplies.

A. First aid kit. The following items shall be available at the dive location:
   1) A physician approved first aid kit, appropriate for the diving or chamber operation, and with current medications (Appendix 9); and
   2) A first aid handbook from the American Red Cross, American Heart Association or equivalent.
B. Oxygen resuscitator.
   1) Positive pressure ventilator or a bag-type manual resuscitator with transparent mask capable of ventilating an unconscious victim.
   2) Sufficient quantity of oxygen to supply a diver for:
      a) The time required to transport them to a higher-level medical care facility; or
      b) 12 hours, whichever occurs first.
   3) Oxygen cylinders shall be maintained within current hydrostatic test date.
   4) Oxygen kits shall be stowed in a clean, protected and clearly labeled space.
C. Automated External Defibrillator (AED). An AED shall be available at the dive site, when practical, and only operated by trained personnel.
D. Backboard. A backboard, in good working condition, shall be available at the dive site when practical.

5.2.8 Equipment Inspection.

A. All diver-worn and related support equipment and systems shall be inspected and tested prior to each dive by the dive team members.
B. Each diver shall conduct a functional check of their diving equipment in the presence of their dive buddy or tender.
C. The Divemaster or Lead Diver shall conduct a final safety check of each diver's gear before allowing divers to enter the water.
D. Any equipment in questionable condition shall be removed from service immediately and clearly labeled in order to preclude its use.
E. Unless otherwise approved by the LODO/SODO, all dive equipment shall be worn in the configuration depicted in Appendix 7.
F. Any LODO/SODO-approved deviation from the standard SEP gear or configuration shall be in written form and kept at the unit level by the UDS.
G. Non-SEP dive equipment shall be inspected by the UDS, or designee.
H. Maintenance records on non-SEP dive equipment shall be kept at the unit level by the UDS.
I. An annual SEP equipment inventory shall be conducted by each diver.

5.2.9 Warning Signal.

A. When diving from surfaces other than vessels in areas capable of supporting marine traffic, the international code flag "A" shall be displayed at the dive location in a manner which allows all-round visibility, and shall be illuminated during night diving operations.
B. When diving in areas capable of supporting marine traffic, a red and white "diver down" sport diving flag, appropriately sized for the vessel used, shall be displayed at the dive location in a manner which allows all-round visibility, and shall be illuminated during night diving operations.

5.2.10 Hyperbaric Chamber Requirement.

A. General. NOAA hyperbaric chambers shall be equipped and operated in accordance with Section 7.2.6 of this manual.
B. No-Decompression Dives.
   1) Dive operations conducted within the U.S. Navy (USN) no-decompression limits and less than 100 fsw may require access to a hyperbaric chamber within 6 hours of the dive location if deemed "intensive" in nature.
   2) If a dive operation is deemed "intensive," as outlined in the NDP Dive Plan Review Policy Algorithm (Appendix 8), then the UDS shall submit a copy of the dive plan to the LODO/SODO to determine the need for an on-site chamber.
C. Decompression dives must be pre-approved by the NDCSB and shall be conducted in accordance with 29 CFR 1910, Subpart T.

5.2.11 Diver Recall Capability. Topside personnel must be capable of recalling divers during all diving operations.

5.3 General Diving Requirements

5.3.1 Water Entry and Exit.

A. A means shall be provided to assist all divers entering and exiting the water.
B. The means provided for exiting the water shall extend below the water's surface.

C. A means shall be provided to extract an unconscious diver from the water.
D. A small boat and qualified operator shall be used to deploy or retrieve divers when dives are conducted beyond a comfortable swimming distance from shore, in areas of strong current, and/or arduous egress.
E. The propulsion system (e.g., propeller, jet drive) of the vessel shall be disengaged before divers enter or exit the water.

5.3.2 Communications.
A. An operational, two-way surface communication system (e.g., VHF radio, cell phone) shall be available at the dive location to obtain emergency assistance.
B. An operational two-way voice communication (wireless or hard-wire) system shall be used when:
1) Diving in surface-supplied mode, between each surface-supplied diver and a dive team member at the dive location; and
2) Diving in tethered SCUBA mode, between solo tethered diver and a topside tender.
C. Diving operations shall be coordinated with other activities in the vicinity which are likely to interfere with the diving operation.

5.3.3 Supervisor Dive Log. A dive log will be kept at the dive location in accordance with Section 10.1.5.

5.3.4 Decompression Tables and Procedures. A set of NOAA-approved decompression tables (as appropriate for the breathing gases used) shall be at the dive location.

5.3.5 Buddy System for SCUBA Diving.
A. All diving activities shall assure adherence to accepted standards of the buddy system for SCUBA diving.
B. Except under emergency conditions, or when tethered or line-tended as a standby diver, the buddy system, consisting of a minimum of two (2) comparably equipped divers in constant visual or physical communication with one another, is required.
C. The buddy system is based upon mutual assistance, especially in the case of an emergency; therefore, SCUBA divers shall remain close enough to each other during dives to render immediate assistance in an emergency.
D. When conditions are such that the probability of separation of divers is high, such as low visibility, some form of direct physical contact between divers should be maintained.
E. If separated during a dive, divers shall try to re-establish contact for no more than 1 minute and if unsuccessful, immediately begin a controlled ascent to the surface.

5.3.6 Safety Stops.
A. For all no-decompression dives conducted deeper than 60 fsw a precautionary safety stop should be performed at a depth between 15 feet and 20 feet for 3-5 minutes.
B. The time spent at a safety stop need not be added to the diver's total bottom time.
C. If sea conditions or breathing gas supply are such that safety stops cannot be performed safely, they may be omitted.

5.3.7 Reserve Breathing Gas Supply Requirement.
A. A diver-carried reserve breathing gas supply of sufficient quantity to allow the diver to reach the surface with a safe ascent rate of 30 ft per minute from the maximum

anticipated working depth shall be provided for each diver consisting of an independent reserve cylinder with a separate regulator RASS.

B. The valve of the reserve breathing gas supply shall be in the closed position prior to and during the dive to ensure the air supply will not be inadvertently depleted during the dive.
C. Systems that may be used to meet the above requirement include:
   1) NOAA RASS for depths to 130 fsw (Appendix 7); and
   2) SpareAir® (3 Ft^3 minimum) for depths ≤ 30 fsw.
D. The NOAA RASS shall be mounted and configured per diagram in Appendix 7. Deviations from the mounting and configuration diagram must be approved by the diver's LODO/SODO and must comply with the following minimum standards:
   1) The tank valve must be easily accessible and not be blocked by any other diver-worn equipment;
   2) The high-pressure hose must be of sufficient length to allow the diver to easily read the high pressure (HP) gauge;
   3) The second-stage hose must be of sufficient length to easily reach the mouth and to allow for head movement (rotation) from shoulder to shoulder;
   4) If a longer hose is used for the second stage, it must be either a) stored where it can be accessed easily, b) worn on a necklace (Tech style) or c) the second stage must be fastened with a proven quick release mechanism (octo-holder etc.) to the BC;
   5) The RASS cylinder must be securely mounted in a manner that allows for easy removal underwater;
   6) The RASS cylinder must remain in the 'off' position during the dive unless the second-stage regulator hose is equipped with an in-line shutoff valve;
   7) If Buoyancy Compensator Device (BCD) cam-bands are used for securing RASS cylinder bracket assemblies, the mounting must not interfere with the intended purpose of the cam-bands;
   8) The RASS cylinder on/off valve must be uniquely identified/configured so that it is easily distinguished, visually or tactually, from the cylinder yoke screw; and
   9) Unless otherwise authorized by the LODO, RASS cylinders shall be mounted either on the diver's right side (e.g., BCD or cylinder) or in front at belt level.

5.3.8 Minimum Cylinder Pressure Requirement.

A. All divers shall frequently check the pressure remaining in their SCUBA cylinders during dives and periodically compare the amounts with those of their dive buddies.
B. All pre- and post-dive SCUBA cylinder pressures will be logged.
C. Any recorded pressure of less than 500 psi will result in temporary suspension of dive privileges for that individual diver until the on-site Divemaster or Lead Diver investigates the matter.
D. If it is determined that the infraction is an unjustified violation of the 500 psi rule, the individual will not be permitted to resume diving until cleared by the diver's UDS.
E. If it is determined that the cause of the infraction is justified (e.g., to render emergency assistance to a dive buddy), then the Divemaster or Lead Diver may lift the suspension and allow the individual to resume diving.
F. Repeated violation of the minimum pressure rule, even if justified, may result in temporary suspension pending review by the UDS.
G. The UDS will report all violations of the 500 psi minimum policy to the LODO/SODO.

5.3.9 Breathing Gas Supplies. Diver-carried breathing gas supplies shall only be used for:
- A. Breathing purposes; and
- B. BCDs and variable-volume drysuits.

5.3.10 Topside Support.
- A. A DPIC must be available at the dive site and ready, willing and able to render assistance in an emergency. This person must be familiar with the dive activities being conducted and physically able to assist in the recovery of an injured diver.
- B. For all dives conducted beyond a comfortable swimming distance from shore, in areas of strong current, arduous egress or outside the no-decompression limits, a support boat and qualified operator is required to be in the water and ready to render assistance as needed.
- C. The small boat operator can serve as the DPIC.

5.3.11 Standby Divers.
- A. A team of standby divers, or a line-tended standby diver, comparably equipped to the diver(s) in the water, shall be ready to enter the water within 1 minute of notification.
- B. Unless called to action, the standby diver(s) must remain on the surface or vessel from which a diving operation is being conducted.
- C. All efforts should be taken to minimize physical and environment stressors on the standby diver(s) as they perform their duties.

5.3.12 Termination of Dive.
- A. Diver Responsibility. It is the responsibility of the diver to terminate the dive, without fear of penalty, whenever they feel it is unsafe to continue the dive, unless to do so compromises the safety of another diver already in the water.
- B. Minimum Cylinder Surface Pressure. The dive shall be terminated while there is still sufficient SCUBA cylinder pressure to permit the diver and their buddy to safely reach the surface with 500 psi in their cylinder(s), including decompression time, or to safely reach an additional air source at the decompression station with 500 psi in their cylinder(s).
- C. A dive shall be terminated when:
  1) A diver, Divemaster, Lead Diver, or vessel captain requests termination;
  2) A diver fails to respond correctly to communications or signals from a dive team member;
  3) A diver loses visual or physical contact with his dive buddy for more than 1 minute;
  4) A diver begins to use a reserve breathing gas supply, other than during a drill;
  5) A diver is forced to use an alternate air source, other than during a drill;
  6) A diver uses buddy breathing, other than during a drill;
  7) An emergency recall is activated from the surface;
  8) There is an equipment failure that may compromise the safety of the diving operation;
  9) Conditions become unsafe for divers or support personnel; or
  10) The standby diver(s) has been deployed to assist any diver.

5.4 Post-Dive Requirements

5.4.1 Precautions.
- A. After the completion of any dive, the Divemaster or Lead Diver shall:

1) Check the physical condition of each diver;
2) Instruct the divers to report any physical problems or adverse physiological effects including symptoms of decompression sickness along with any equipment malfunctions; and
3) Remind divers to remain together for 30 minutes and monitor their dive buddies.

B. For any dive outside the no-decompression limits, Divemasters or Lead Divers shall instruct the divers to remain awake and in the vicinity of the hyperbaric chamber which is at the dive location for at least 1 hour after the dive (including decompression or treatment as appropriate).

5.4.2 Post-Dive Debriefing and Checklist.

A. Following each dive a debriefing shall be conducted including at a minimum, but not limited to:
1) Dive profile information (maximum depth, maximum bottom time and ending cylinder pressure);
2) Completion of goals and objectives;
3) Suggestions for next team of divers;
4) Location and contact information of a hyperbaric chamber which is ready for use; and
5) Potential hazards regarding flying or ascending to altitudes in excess of 1000 feet within 24 hours after completion of a dive.

B. Post Dive Checklist. Complete the Post Dive section of the NOAA Pre and Post Dive Checklist and file for 24 hours following the completion of dive operations, unless there is an incident in which case it shall be kept indefinitely.

5.4.3 Dive Incident Reporting and Investigation.

A. Dive-related injuries requiring medical treatment beyond basic first aid shall be reported, investigated and documented as prescribed in Section 10 of this manual.
B. All ‘near-miss” or “close call” incidents that could have resulted in a fatality or serious injury to a dive team member shall be reported and documented in accordance with the policies and procedures outlined in Section 10 of this manual.

5.4.4 Post-Dive Health Considerations.

A. Divers shall limit pre- and post-dive exertion due to the potential of bubble formation that could lead to decompression sickness, and
B. Report all injuries, and signs or symptoms of hyperbaric maladies to the Divemaster or Lead Diver as soon as they are experienced.

SECTION 6: DIVING PROCEDURES

6.1 SCUBA Diving Mode

6.1.1 General.

A. SCUBA diving mode, as distinct from surface-supplied mode, consists of two methods: free-swimming and tethered.

B. All SCUBA operations conducted using tethered or line-tended divers (including standby divers) shall be conducted from a moored or fixed platform (i.e., no liveboating).

C. A team of divers or a tended diver shall be stationed at the underwater point of entry when diving is conducted in enclosed or physically confining spaces.

D. Divers trained in specialized diving techniques and equipment (e.g., line and tethered SCUBA diving, drysuits) must maintain annual proficiency in the types of equipment and procedures for which they are authorized. Failure to maintain proficiency may result in loss of authority to perform such dives.

6.1.2 Manning Requirements. The following minimum personnel are required to conduct a SCUBA dive:

A. Non-tethered, free swimming (minimum 4):

Divers	2
DPIC	1
Standby Diver[1]	1
Total	4

Divers	2
DPIC	1
Standby Diver[2]	2
Total	5

B. Tethered (minimum of 3):

Divers	1
DPIC	1
Standby Diver[1]	1
Total	3

Divers	2
DPIC	1
Standby Diver[2]	2
Total	5

Notes:

[1] The standby diver must be line-tended by the DPIC or another trained individual.

[2] Line-tending not required if two standby buddy divers are used.

6.1.3 Limits. SCUBA diving shall not be conducted:

A. At depths deeper than 130 fsw;

B. At depths between 100 – 130 fsw, outside the no-decompression limits, or using mixed gases unless a hyperbaric chamber is ready for use and on-site (i.e., 5 minutes);

C. Outside the no-decompression limits without the prior approval of the NDCSB;

D. Against currents exceeding one (1) knot unless line tended;

E. In enclosed or physically confining spaces unless line-tended by a pair of divers stationed at the point of entry; or

F. From an underway vessel when sea conditions prevent safe deployment, retrieval or tracking of divers.

6.1.4 Line Tenders.

A. Non-tethered, free swimming mode.

1) In this mode, line-tending is used only in an emergency; and
2) Training consists of completing the Line-Tending Standby Divers training module on the NDC website at www.ndc.noaa.gov and the skills portion under the direction of a UDS or designee.

B. Tethered mode.
1) In this mode, line-tending is required; and
2) Training consists of completing an NDP-approved line-tended diving course.

6.1.5 Use of Dive Computers.

A. Any commercially available dive computer may be used for no-decompression diving by completing a Dive Computer User Agreement, available from the NDC website at www.ndc.noaa.gov. The agreement must be on file at the NDC for each specific model of dive computer prior to their use.
B. Dive computers for decompression dives must be approved by the NDCSB.

6.2 Drysuit Diving

6.2.1 General.

A. NOAA divers wanting to use drysuits must complete formal training in the equipment and be certified by the NDPM.
B. Such training may be obtained from a number of sources including, but not limited to NOAA, U.S. military, academic institutions, and recreational agencies.
C. Experience may be substituted for formal training as determined by the NDPM.

6.2.2 Training. At a minimum, formal drysuit training shall include:

A. Academic instruction:
1) Drysuit components;
2) Equipment preparation and maintenance;
3) Donning and doffing procedures;
4) Weighting systems and usage; and
5) Emergency procedures.

B. Practical instruction:
1) Pool:
a) Equipment preparation;
b) Donning and doffing procedures;
c) Disconnecting and reconnecting drysuit inflator hose;
d) Buoyancy control; and
e) Emergency procedures;
2) Confined or open-water dives with an instructor:
a) Emergency management for excess positive buoyancy;
b) Ditching of weights; and
c) Disconnecting and reconnecting drysuit inflator hose
3) Drysuit certification requires a minimum of five (5) open-water dives wearing a drysuit for a cumulative bottom time of at least 120 minutes.

6.2.3 Equipment.

A. In addition to the standard SCUBA diving configuration listed in Section 7.3.1, NOAA drysuit divers shall also wear a weight-harness system with a quick-release mechanism requiring the use of only one hand.

B. Ankle weights are optional except during initial drysuit training.
C. A drysuit diver's buoyancy should be controlled by the suit itself while underwater; whereas, the BCD should only be used for surface flotation.
D. The use of non-SEP-issued drysuits must be pre-approved by the UDS or designee based on inspection of the suit for condition and functionality.

6.2.4 Emergency Procedures.
A. Loss of positive buoyancy.
1) The diver should ditch one or both sides of his harness weights, terminate dive and swim to the surface.
2) Once at surface, inflate the BCD.
B. Excess positive buoyancy. The diver should, in order of preference:
1) Swim down to compress air in suit to help reduce excess buoyancy;
2) Roll to head-up position;
3) Dump air from suit using exhaust valve;
4) Dump air from suit at wrist or neck seals; or
5) Flare-out to increase surface area to help slow ascent and exhale.
C. Free-flowing suit inlet valve.
1) Manually disconnect the inflator hose from suit.
2) If ascending too quickly, follow instructions for excess positive buoyancy above.

6.3 Line-Tended SCUBA Diving

6.3.1 General.
A. Line-tended SCUBA diving is a specialized diving technique whereby divers are connected to the surface via a strength member (line) managed by a trained individual topside.
B. As defined by NOAA, line-tended diving does not utilize voice communications, and therefore, can only be used by standby divers.
C. Each line-tended SCUBA diver must be tended by a separate tender.

6.3.2 Manning Requirements (Section 6.1.2).

6.3.3 Limits. Line-tended SCUBA diving is restricted to the same limits as non-tethered, free-swimming SCUBA mode (Section 6.1.3).

6.3.4 Equipment Requirements. In addition to standard SCUBA diving equipment, divers shall be tended with a strength member (line) capable of lifting the diver from the water.

6.3.5 Training Requirements.
A. Academic instruction shall include, but not be limited to:
1) Specialized equipment;
2) Tending procedures;
3) Communication procedures;
4) Diving procedures; and
5) Emergency procedures.
B. Practical instruction shall include, but not be limited to:
1) Dressing procedures;
2) Tending procedures; and

3) Emergency procedures.

C. Non-divers may be trained as tenders and shall participate in the entire training session, minus the actual diving portion, outlined in this section. Academic instruction for line tended training can be found at www.ndc.noaa.gov.

6.3.6 Tender Responsibilities.

A. It is the tender's responsibility to ensure the diver receives proper care while topside and underwater.
B. While the diver is submerged, the tender handles the tending line and communicates with the diver via line-pull signals.
C. Line-tended divers and tenders may develop additional line pull signals, but all divers and tenders must know standard line signals adapted from the USN.

6.4 Tethered SCUBA with Voice Communications

6.4.1 General.

A. When conducting tethered SCUBA diving operations the diver shall be equipped with a life-line and voice communications.
B. Standby diver may also be outfitted with two-way voice communication, but it is not a mandatory requirement.

6.4.2 Manning Requirements (Section 6.1.2).

6.4.3 Limits. Tethered SCUBA diving is restricted to the same limits as non-tethered, free-swimming SCUBA mode (Section 6.1.3).

6.4.4 Equipment Requirements. In addition to standard SCUBA diving equipment, the following minimum items shall be included in a tethered SCUBA diving assembly:

A. Demand breathing lightweight full-face mask with communications;
B. Strength member tether with quick release snap shackle;
C. Hardwired or wireless voice communications;
D. Surface communications unit; and
E. Man-rated safety harness for lifting the diver from the water.
F. Any deviation from the above requirements must be approved by the LODO/SODO.

6.4.5 Training.

A. Academic instruction shall include, but not be limited to:
   1) Tether equipment;
   2) Tending procedures;
   3) Communication procedures;
   4) Diving procedures; and
   5) Emergency procedures.
B. Practical instruction shall include, but not be limited to:
   1) Pool or confined-water conditions:
      a) Dressing procedures;
      b) Diving procedures;
      c) Tending procedures; and
      d) Emergency procedures.

2) Open-water instruction shall include, but not be limited to a minimum of 5 dives with a minimum cumulative bottom time of 150 minutes for certification.

C. Non-divers may be trained as surface tenders and shall participate in the entire training session, minus the actual diving portion, outlined in this section. Academic instruction for line tended training can be found at www.ndc.noaa.gov.

6.4.6 Tender Responsibilities.

A. It is the tender's responsibility to ensure that the diver receives proper care while topside and underwater.

B. While the diver is submerged, the tender handles the tether, maintains communications, and monitors diver's air usage by periodically requesting pressure readings from the diver.

C. The usual means of communications between diver and tender is by voice intercom. However, it is important that basic line signals be memorized and practiced so they will be recognized instantly in the event of intercom failure.

D. Dive teams may develop additional line pull signals, but all divers and tenders are required to know standard line signals adapted from the USN.

6.4.7 Emergency Procedures.

A. Loss of primary gas supply. The diver will switch to the reserve breathing supply, notify topside personnel, terminate the dive and follow their tether back to the surface.

B. Loss of voice communication. The diver will stop all activity, signal topside personnel via line-pull signals and begin ascent to the surface.

C. Entanglement.

1) The diver will notify topside personnel via voice communications or line-pull signals and wait for assistance from the standby diver.

2) If the standby is delayed or the diver is in jeopardy of running out of air, the diver can disconnect themselves from the tether and swim to the surface.

D. Flooded mask. If the diver is unable to purge a flooded mask, they will switch to the reserve breathing supply, notify topside personnel via line-pulls, terminate the dive, and ascend to the surface.

6.4.8 Proficiency Requirements. In order to maintain tethered SCUBA diving certification, all trained divers and tenders must perform/tend at least one tethered SCUBA dive every 12 months. Dives will be documented using the standard on-line dive log.

6.5 Diving in Low Visibility

6.5.1 General.

A. Section 1910.424(c)(2) of the Occupational Safety and Health Administration (OSHA) Commercial Diving standards for SCUBA diving states, "A diver shall be line-tended from the surface, or accompanied by another diver in the water in continuous visual contact during the diving operation."

B. Section H.1.b. of OSHA Directive CPL 02-00-143 for 29 CFR 1910, Subpart T, notes: "When two SCUBA divers are in the water, one tending line to the surface is sufficient when the two divers are connected by a "buddy line."

C. NOAA diving operations conducted in low visibility, as defined in Appendix 2 of this manual, shall comply with the standards outlined in this policy.

6.5.2 Requirements.

A. The following options are for conducting scuba diving operations in low visibility:
   1) Deploy one line-tended diver and have another line-tended diver standing by on the surface, or
   2) Line-tend one of the divers in a buddy team from the surface and have the other diver connected to the tended diver via a "buddy line" which can be quickly released.
B. The use of line-tending equipment and techniques requires completion of the Procedures for Tending Standby Scuba Divers presentation found in the 'Training and Certification' section of the NOAA Diving Center website followed by "hands-on" practice conducted by the Unit Diving Supervisor, or designee.
C. All members of the dive team, including divers and topside tenders, must complete the prescribed training prior to conducting line-tending operations.
D. Should underwater visibility deteriorate to the point visual contact can no longer be maintained, the divers must terminate the dive, return to the surface, and initiate line-tended operations described above.

6.5.3 Equipment.

A. Equipment used for line-tending diver(s) in zero visibility (as defined above) shall comply with standards described in the Procedures for Tending Standby Scuba Divers presentation.
B. Buddy lines used to maintain tactile contact between two divers shall be limited to a maximum length of six (6) feet and be secured to each diver in a manner that can be quickly released if required.

6.5.4 Responsibilities.

A. NOAA Divemaster
   1) Determines when procedures for diving in low visibility must be initiated.
   2) Ensures all dive team members have completed line-tending training and that the minimum required equipment to perform low-visibility diving is available.
   3) Determines which deployment protocol (Section 6.5.2A) to use to conduct the low-visibility dives.
B. NOAA Unit Diving Supervisor. Appoints Divemasters to oversee and direct diving operations.

6.6 Surface-Supplied Air Diving Mode

6.6.1 General.

A. Surface-supplied dives are those dives where the primary breathing gas is supplied from the surface by means of a pressurized umbilical.
B. NOAA divers engaged in surface-supplied diving activities shall comply with the requirements outlined in this section, unless otherwise specified by the NDCSB.

6.6.2 Limits.

A. Surface-supplied diving shall not be conducted at depths deeper than 190 fsw, except that dives with bottom times of 30 minutes or less may be conducted to depths of 220 fsw.
B. Dives outside the no-decompression limits or deeper than 100 fsw require a dual lock, multiplace hyperbaric chamber located within 5 minutes of the dive location.
C. A bell shall be used for dives with an in-water decompression time greater than 120 minutes, except when diving is conducted in physically confining spaces.

6.6.3 Minimum Personnel.

A. The minimum number of personnel to conduct surface-supplied dives is as follows:

Diver	1
DPIC	1
Tender	1
Standby Diver	1
Total	4

B. Additional personnel may be required based on the specific operation.

6.6.4 General Procedures.

A. Each diver shall be continuously tended by a separate dive team member while in the water.
B. A diver shall be stationed at the underwater point of entry when diving is conducted in enclosed or physically confining spaces.
C. Each diving operation shall have a primary breathing gas supply sufficient to support divers for the duration of the planned dive including the ascent phase of the dive.
D. A standby diver shall be available while a diver is in the water.
E. A diver-carried reserve breathing gas supply shall be provided for each diver.
F. A dive-location reserve breathing gas supply shall be provided.
G. Non-return valves on mask or helmets shall be functionally tested prior to commencement of dive.

6.7 Blue-Water Diving

6.7.1 General.

A. Blue-water diving is defined as diving conducted in any body of water in which there is no physical bottom within diving depth ranges, depth is deeper than diver certification and/or depth is greater than breathing gas Maximum Operating Depth. This diving mode is also called over-bottom diving.
B. Diving in blue-water presents a number of unique challenges including:
   1) Increased chances of vertigo;
   2) Exceeding depth limits;
   3) Exceeding allowable bottom times; and
   4) Increased breathing gas consumption due to the depth.
C. Blue-water diving must be carefully planned and executed and approved by the LODO/SODO.

6.7.2 Equipment Requirements.

A. All divers diving in blue-water conditions shall have a means to compensate for catastrophic loss of buoyancy (e.g., a lift bag, drysuit with BCD or safety sausage) and a surface signaling device if un-tethered.
B. No over-bottom dives shall be made unless some direct reference with the surface is maintained.

6.7.3 Training. At a minimum, blue-water dive training should include procedures for:

A. Deploying and using any specialized harnesses or rigging that may be utilized; and
B. Deploying a lift-bag.

6.7.4 Emergency Procedures.
- A. Loss of positive buoyancy:
  1) Notify buddy diver of problem;
  2) Ditch weights or weight belt; or
  3) Deploy lift-bag using line-reel and pull self up the downline.
- B. Loss of spatial orientation or vertigo. Notify buddy diver of problem and with their assistance, terminate dive, and ascend to surface.

6.8 Overhead Obstruction Diving

6.8.1 General. This section covers any diving environment where the diver cannot easily reach the surface in the event of equipment failure or a compromised breathing supply due to an overhead physical obstruction. (This does not include ship husbandry dives).

6.8.2 Equipment Requirements.
- A. Equipment used for SCUBA in an overhead environment is based on the concept of redundancy.
- B. In addition to standard SCUBA diving equipment the following equipment is required when diving in an overhead environment:
  1) A diver-carried, independent reserve breathing gas supply with separate SCUBA regulator and sufficient gas volume to allow the diver to safely return to the surface;
  2) A slate and pencil;
  3) Redundant underwater lights, knives, and line reels as deemed appropriate by the LODO/SODO.

6.8.3 Training and Proficiency.
- A. The requirement for overhead obstruction dive training will be left to the discretion of the LODO/SODO.
- B. Dive experience in lieu of training may be approved by the LODO/SODO.
- C. When diving of this type is not performed on a routine basis then ‘work-up’ dives shall be completed prior to the dive mission.

6.8.4 Diving Procedures.
- A. With this technique a dive team shall be considered to be cavern diving if at any time during the dive they find themselves in a position where they cannot complete a direct, unobstructed vertical ascent to the surface because of rock formations.
- B. Overhead obstruction diving shall not be conducted at depths greater than 100 feet.
- C. Dive teams shall perform a safety drill prior to commencing cavern (overhead) diving operations that includes locating and rescuing a trapped diver.
- D. Each team within the cavern zone must utilize a continuous guideline appropriate for the environment leading to a point from which an uninterrupted vertical ascent to the surface may be made.
- E. Gas management must be appropriate for the planned dive.

6.9 Cold-Water Diving

6.9.1 General.
- A. Definition. Dives conducted in water temperatures colder than 50 degrees F.

B. Due to the increased risks associated with cold water diving, such operations must be carefully planned and executed and pre-approved by the UDS.
C. Dives conducted in water temperatures colder than 50 degrees F have the potential for regulator freeze-up.

6.9.2 Qualifications.
A. Must be a currently authorized NOAA diver.
B. Cold water dive training is strongly recommended.

6.9.3 Equipment. The following procedures for cold water diving should be followed:
A. Refill SCUBA cylinders only at filling stations equipped with an efficient filtering and moisture removal system;
B. When preparing for a cold water dive, keep SCUBA cylinders and regulators in a place that is sheltered from the cold until just before starting the dive;
C. Open the SCUBA cylinder control valve for 1 or 2 seconds to make sure there are no water droplets or small ice crystals. Also check the inlet opening of the regulator;
D. For repetitive dives, take particular care to ensure that the SCUBA regulator is completely dry before starting the second dive;
E. Avoid breathing from the regulator prior to immersion;
F. As much as possible, try to prevent water from entering inside the second stage during the dive;
G. Never operate the purge button unless underwater;
H. Use the purge button as little as possible. In any case, never hold it down for more than 2 or 3 consecutive seconds; pressing it for longer may cause ice to form; and
I. Breathe normally in order to minimize the cooling effect produced by the higher air velocity during over breathing.

6.10 Snorkeling / Breath-Hold Diving

6.10.1 General. This section applies only to NOAA divers who conduct snorkeling as part of their official duties.

6.10.2 Qualifications. Must be a currently authorized NOAA diver.

6.10.3 Limits. Unless specifically authorized by the UDS, snorkeling/breath-hold diving shall not be conducted:
A. At depths greater than 30 feet;
B. In areas with potential underwater entanglements;
C. In seas greater than 3-5 feet; or
D. In current greater than 0.5 knots.

6.10.4 Requirements.
A. Unless specifically authorized by the UDS, each snorkeler/breath-hold diver shall be equipped with:
1) Mask;
2) Fins;
3) Snorkel;
4) A flotation vest capable of providing positive buoyancy; and

5) Cutting device.

B. The UDS may also require a buddy snorkeler/breath-hold diver.

6.11 Hyperbaric Chamber Operations

6.11.1 General.

A. All hyperbaric chambers used by NOAA personnel shall meet established operational policies and training requirements outlined in the NOAA Diving Manual and 29 CFR 1910, Subpart T.

B. For all dives requiring decompression, deeper than 100 fsw or mixed-gas operations, a dual lock, multi-place hyperbaric chamber shall be located within 5 minutes of the dive location.

6.11.2 Manning Levels. The following are the minimum personnel requirements and positions for conducting chamber operations:

Supervisor/Operator	1
Inside Tender	1
Systems Operator	1
Diving Medical Officer	1
Total	4

6.11.3 Personnel Responsibilities and Qualifications.

A. Chamber Supervisor.

1) Responsibilities:

a) Assigns and supervises chamber personnel;

b) Supervises and directs all chamber and chamber-related operations;

c) Ensures operations are conducted and documented properly in according with established standards; and

d) Coordinates treatment procedures with medical personnel and vessel captain.

2) Qualifications:

a) Demonstrated proficiency in the supervision and operation of hyperbaric chambers during operations and treatment procedures;

b) Demonstrated knowledge in diving accident management;

c) Must be a current Diver Medical Technician (DMT) certified by the National Board of Diving and Hyperbaric Medical Technology (NBDHMT) or have equivalent knowledge and experience as determined by the NDPM; and

d) Must be approved by the NDPM.

3) Authority Level.

a) The designated Chamber Supervisor is responsible for the operation of the hyperbaric chamber and has the final decision making authority for all aspects related to operation of the chamber.

b) Emergency conditions may warrant actions contrary to the dictates of this document. The Chamber Supervisor is authorized to deviate as necessary to prevent or minimize harm to human life.

c) Any deviation from these standards and procedures must be reported to the NDPM within 24 hours of the occurrence.

B. Chamber Operator.

1) Responsibilities:

a) Controls and maintains all gases entering and exiting the chamber;
b) Pressurizes and de-pressurizes chamber;
c) Monitors and regulates inside chamber atmosphere; and
d) Communicates with personnel inside the chamber.

2) Qualifications:
a) Demonstrated knowledge of the hyperbaric chamber and related systems;
b) Demonstrated proficiency in the operation of the hyperbaric chamber and related systems; and
c) Must be approved by the Chamber Supervisor.

C. Inside Tender.
1) Responsibilities:
a) Provides normal and emergency assistance as required inside and outside the hyperbaric chamber;
b) Communicates with outside personnel;
c) Administers medical aid and therapeutic breathing gases as directed by the Chamber supervisor; and
d) Monitors the condition of personnel in the chamber.

2) Qualifications:
a) Demonstrated knowledge of in diving accident management and emergency medical care;
b) Must be a current certified diver;
c) Must be a current NBDHMT-certified DMT or equivalent; and
d) Must be approved by the Chamber Supervisor.

D. Systems Operator.
1) Responsibilities:
a) Maintains, monitors, and controls compressed gas supplies to the chamber; and
b) Keeps Chamber Supervisor and/or Operator informed of treatment and supply gas status.

2) Qualifications:
a) Demonstrated knowledge of the chamber and support systems;
b) Demonstrated proficiency in the operation of the chamber support systems; and
c) Must be approved by the Chamber Supervisor.

E. Time/Log Keeper.
1) Responsibilities:
a) Records data during chamber operations (e.g., depths, times, significant treatments, responses, events, communications, chamber atmosphere); and
b) Keeps Chamber Supervisor and/or Operator informed of depth, time, and breathing periods.

2) Qualifications:
a) Familiarity with chamber treatment tables, dive log, and timekeeping devices;
b) Ability to follow instructions and record information precisely and neatly; and
c) Must be approved by the Chamber Supervisor.

F. Diving Medical Officer.
1) Responsibilities:
a) Prescribes and administers as necessary, hyperbaric chamber treatment procedures; and
b) Prescribes and administers appropriate medications and advanced life saving techniques in a hyperbaric environment.

2) Qualifications:
   a) Successful completion of a NOAA-approved DMO course;
   b) Must be able to perform duties in a hyperbaric environment; and
   c) Must be approved by the Chair, NDMRB.

6.11.4 Operating Requirements.

A. Pre-dive.
   1) Prior to operation of the chamber, a NDP chamber pre-dive checklist shall be completed.
   2) Prior to commencement of recompression treatment, the Chamber Supervisor shall consult with a NOAA-approved DMO.
   3) If unable to reach the DMO, the Chamber Supervisor or designee shall contact the NDPM at the first appropriate opportunity to inform him of the situation and the planned course of action.

B. During Chamber Treatment. Should recompression treatment be required, the Chamber Supervisor shall regularly consult with a NOAA-approved DMO at appropriate times throughout the treatment.

C. Post-dive.
   1) Upon completion of chamber operations, the patient should be seen by a NOAA-approved DMO.
   2) The chamber team shall be available at the dive location for a minimum of 1 hour after the dive to operate the chamber.
   3) Patient shall remain near the hyperbaric chamber for a minimum of 1 hour post-dive.
   4) A NDP chamber post-dive checklist shall be completed at the conclusion of chamber operations.
   5) The hyperbaric chamber shall be maintained in a state of readiness prior to, during and following all dives for a minimum of 1 hour.

6.12 Contaminated Water Diving

Diving in water contaminated with hazardous biological, chemical or radioactive pollutants requires specialized training, equipment, and diving protocols and is currently outside the scope of the NDP. Until such time that these elements are established, NOAA divers are prohibited from diving in contaminated water. Qualified contract divers should be hired to dive in these conditions.

6.13 Decompression Diving

Dives conducted beyond the US Navy No-Decompression Limits shall be conducted in accordance with standards outlined in 29 CFR 1910, Subpart T.

6.14 Working Techniques

6.14.1 Hand-Held Pneumatic-Power Tools and Equipment.

A. Hand-held power tools and equipment shall:
   1) Be de-energized before being placed into or retrieved from the water; and

2) Only be supplied with power from the dive location when specifically requested by the diver.

B. The use of spear guns, power heads, or similar devices must be pre-approved by the LODO/SODO.

6.14.2 Welding and Burning.

A. A current supply switch to interrupt the current flow to the welding or burning electrode shall be:
   1) Tended by a dive team member in voice communication with the diver performing the welding or burning; and
   2) Kept in the open (off) position except when the diver is welding or burning.
B. The welding machine frame shall be grounded.
C. Welding and burning cables, electrode holders, and connections shall be capable of carrying the maximum current required by the work, and shall be properly insulated.
D. Insulated gloves shall be provided to divers performing welding and burning operations.
E. Prior to welding or burning on closed compartments, structures or pipes, which contain a flammable vapor or in which a flammable vapor may be generated by the work, they shall be vented, flooded, or purged with a mixture of gases which will not support combustion.

6.14.3 Explosives and Unexploded Ordinance.

A. The use of explosives requires specialized training, equipment and diving protocols and is currently outside the scope of the NDP.
B. Until such time that these elements are established, NOAA divers are prohibited from using explosives. Qualified contract divers should be hired if this expertise is required.
C. Diving within 100 feet of a known unexploded ordinance is strictly forbidden without prior approval of the NDCSB.
D. If unexploded ordinance is discovered during the course of a dive, divers shall leave it undisturbed and immediately move away from the area swimming in the direction from which they approached. Report the sighting to the senior person on site.

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SECTION 7: EQUIPMENT

7.1 General Policy

7.1.1 Operation and Maintenance.

A. All equipment (e.g., diver worn, dive support, air systems, hyperbaric chambers) shall be operated and maintained in accordance with the manufacturer's recommendations unless otherwise approved by the NDCSB.
B. All equipment shall be regularly examined by the person using it prior to diving.
C. All equipment repair, test, calibration or maintenance service shall be recorded by means of a tagging or logging system, and shall include the date, nature of work performed, and the name or initials of the person or company performing the work.
D. Equipment subjected to extreme usage under adverse conditions requires more frequent testing and maintenance.
E. Any diving conducted using specialized equipment or procedures (e.g., drysuits, full face masks, tethered or line-tended SCUBA) shall be practiced on an annual basis to maintain proficiency. Failure to meet these minimum standards requires work-up dives to be conducted prior to making duty dives.
F. All diving equipment shall be stored in a secure, properly ventilated space free of noxious fumes and corrosive elements.
G. Diving units shall be afforded sufficient space to properly maintain and organize all diving equipment.
H. An inventory of SEP issued diving equipment shall be conducted by each diver annually and the results submitted to the UDS.

7.1.2 Oxygen Safety.

A. Equipment used with gases containing over 40 percent by volume oxygen shall be designed for or adapted for oxygen service.
B. Components (except umbilicals) exposed to gas mixtures containing over 40 percent by volume oxygen shall be cleaned of combustible materials before use.
C. Oxygen systems over 125 pounds per square inch gauge (psig) and compressed air systems over 500 psig shall have slow-opening shut-off valves.

7.2 Support Equipment

7.2.1 Emergency Oxygen Kits.

A. A positive-pressure ventilator and a bag-type manual resuscitator with transparent mask or equivalent capable of ventilating an unconscious victim shall be available at the dive location.
B. Oxygen regulators must be capable of supplying oxygen to two individuals simultaneously, one via a demand/positive pressure regulator and the other via a non-return, free-flow mask.
C. Sufficient quantity of oxygen to supply two divers for:
   1) The time required to transport them to a higher-level medical care facility; or
   2) 12 hours, whichever is less.
D. The regulator and Elder valve positive pressure/demand regulators used to deliver oxygen shall be tested annually to ensure delivery pressure is within the manufacturer's specifications.

E. If an NDC issued regulator is determined to be out-of-specification, the NDC shall be notified and a replacement provided by NDC.
F. Oxygen kits shall be checked before every day of diving.

7.2.2 First Aid Kits.

A. A first aid kit appropriate for the dive location and approved by the NDP DMO shall be available at the dive location.
B. First aid kits shall have the minimum equipment and supplies as listed in the NOAA Small First Aid Kit contents list (See Appendix 9 for first aid kit contents.)
C. If the vessel/dive site has space available the NOAA Large First Aid Kit should be available.

7.2.3 Air Compressor Systems.

A. Air compressors shall be:
   1) Maintained and operated in accordance with the manufacturer's recommended guidelines; and
   2) Located in a space that is clean and free of flammable material.
B. Air compressor intakes shall be clearly labeled and located away from areas containing exhaust or other contaminants.
C. Hearing protection shall be made available as necessary to comply with OSHA standards.
D. Air compressor relief valves shall be tested for proper operation annually.
E. The output of air compressor systems shall be tested for air purity every 6 months.
F. Non-oil lubricated compressors need not be tested for oil mist.
G. The test results shall be maintained both at the unit and NDC and easily accessible by all users upon request.
H. When possible, the test results should be posted near the compressor.
I. A log shall be maintained showing operation, repair, overhaul, filter maintenance, and temperature adjustment for each compressor.
J. A copy of the manufacturer's operators manual shall be readily available for reference and written operating procedures posted near the compressor.
K. All air system components (e.g., plumbing, valves, gauges) shall be:
   1) Properly rated for the working pressure of the system and labeled as to their functions; and
   2) Properly secured to prevent injury.
L. Compressors used to supply air to the diver shall be equipped with a volume tank with a check valve on the inlet side, a pressure gauge, a relief valve, and a drain valve.
M. All SCUBA charging whips shall be:
   1) Properly secured to prevent injury to personnel during cylinder filling operations; and
   2) Visually inspected for damage or deterioration prior to each use.
N. Compressed gas cylinders. Shall:
   1) Be designed, constructed and maintained in accordance with provisions of 29 CFR 1910.101 and 1910.169 through 1910.171;
   2) Be stored in a ventilated area and protected from excessive heat;
   3) Be secured from falling;
   4) Have shut-off valves recessed into the cylinder or protected by a cap, except when in use, interconnected, or when used for SCUBA diving; and
   5) Be serviced every 5 years if part of a bank of cylinders and marked with a star (★).

7.2.4 Air Quality Standards. Breathing air for NOAA diving shall meet the following specifications as set forth in 29 CFR 1910.430 (b) (3).

NAVSEA 0910-LP-106-0957 USN Diving Manual, VOL 1, REV 6, 15 APR 2008, TBL 4-1	
Component	Maximum
Oxygen	20 - 22%
Carbon Dioxide	1000 PPM
Carbon Monoxide	20 PPM
Condensed Hydrocarbons	5 mg/m3
Total Hydrocarbons as Methane	25 PPM
Objectionable Odors	None

7.2.5 Breathing Gas Supply Hose Connectors. These shall:

A. Be made of corrosion-resistant materials;
B. Have a working pressure at least equal to the working pressure of the hose to which they are attached; and
C. Be resistant to accidental disengagement.

7.2.6 Hyperbaric Chamber Equipment and Systems.

A. General.
   1) Hyperbaric chambers used by NOAA divers manufactured after 1977 shall be built and maintained in accordance with the American Society of Mechanical Engineers (ASME) Code or equivalent.
   2) Hyperbaric chambers used by NOAA divers manufactured prior to 1977 shall be maintained in conformity with the code requirements to which it was built, or equivalent.
   3) Each hyperbaric chamber shall be equipped with:
      a) Means to maintain the atmosphere below a level of 25 percent oxygen by volume;
      b) Mufflers on intake and exhaust lines, which shall be regularly inspected and maintained;
      c) Suction guards on exhaust line openings; and
      d) A means for extinguishing fire, and shall be maintained to minimize sources of ignition and combustible material.

B. Multi-lock chambers. The following minimum components must be on site and fully-functional prior to commencing HBO treatments:
   1) Adequate and fully accessible chamber air supply (i.e., HP or Low Pressure);
   2) Oxygen Built-in Breathing Systems (BIBS) masks with overboard dump systems (minimum one (1) per occupant);
   3) An emergency air BIBS mask (minimum one (1) per occupant);
   4) Depth gauge (minimum one (1) per lock);
   5) Fire prevention (internal);
   6) Timer (e.g., stop watch, wrist watch, wall clock);
   7) Two-way voice communications;
   8) One (1) view port (minimum one (1) per lock);

9) Illumination capability to light the interior; and
10) USN Treatment Tables (TTs).

C. Support equipment, supplies and materials. The following items must be readily available on site prior to commencing HBO treatments.
   1) Medical Supplies:
      a) Primary emergency supplies (see USN Diving Manual); and
      b) Secondary emergency supplies (see USN Diving Manual).
   2) Reference Material:
      a) USN Diving Manual;
      b) NOAA Diving Manual;
      c) Advanced Cardiac Life Support algorithms;
      d) Operational Procedures Manual for specific chamber;
      e) NOAA Dive Accident Management Field Reference Guide; and
      f) Operating Standards for NOAA Hyperbaric Chambers.

D. Gas supply requirements.
   1) Compressed Air Supply Requirements:
      a) All chambers shall have access to two (2) sources of compressed air for pressurization, ventilation and BIBS supply; and
      b) Minimum quantities shall be in accordance with the NOAA Diving Manual.
   2) Oxygen Supply Requirements:
      a) The chamber shall be capable of supplying 100 percent oxygen to each occupant in the chamber via BIBS masks;
      b) Minimum quantity required is 475 ft3; and
      c) The above quantity is based on a USN TT (TT6) with full extensions at 60-feet and 30-feet for one (1) diver breathing oxygen (respiratory minute volume of 0.475 actual cubic feet per minute (acfm)) throughout the treatment (400 ft3), plus the tender during last 30 minutes and ascent (75 ft3).

7.3 Open-Circuit SCUBA Diving Equipment

7.3.1 Minimum Equipment Requirements.

A. Standard equipment configuration. Unless otherwise approved by the LODO/SODO, each diver shall be configured consistent with the figures shown in Appendix 7.

B. At a minimum, all NOAA certified divers are required to use the following NOAA-issued dive equipment when conducting official duty dives, unless specifically approved by the LODO/SODO:
   1) A primary breathing gas supply and regulator;
   2) A diver-carried reserve breathing gas supply consisting of an independent reserve cylinder with a separate regulator. The valve of the reserve breathing gas supply shall be opened to check he pressure in the cylinder and to charge the regulator, and then closed prior to and during the dive to ensure the air supply will not unintentionally be depleted during the dive;
   3) A redundant second stage regulator on the primary cylinder(s) for air sharing;
   4) A pressure gauge for each independent cylinder, readable by the diver during the dive;
   5) A face mask;
   6) A snorkel;
   7) A buoyancy compensation device;
   8) A weight system capable of quick release;
   9) A knife or other cutting device;

10) A pair of swim fins;
11) A timekeeping device;
12) A depth gauge;
13) Thermal protection appropriate for the conditions; and
14) A whistle or other sound producing device.

7.3.2 Regulators.

A. Unless approved otherwise by the LODO/SODO, all SCUBA regulators other than those issued via the SEP shall be listed on the USN's Authorized for Navy Use list.
B. Regulators shall consist of a primary first and second stage, an alternate second stage, and a submersible pressure gauge.

7.3.3 Buoyancy Compensator Devices.

A. BCDs shall be worn on all dives utilizing SCUBA.
B. BCDs shall enable the diver to achieve positive buoyancy during a dive, including at the surface, and be configured with a manually-activated inflation assembly, an oral inflation assembly, and an exhaust valve.
C. The inflation assembly shall be serviced every 12 months from the date of issue.
D. BCDs shall not be used as a lifting device in lieu of lift bags.

7.3.4 Gauges and Timekeeping Devices.

A. Each independent cylinder used shall be equipped with a pressure gauge capable of being monitored by the diver during the dive.
B. A timekeeping device shall be:
   1) Worn by each diver; and
   2) At the dive location for topside support.

7.3.5 SCUBA Cylinders. SCUBA cylinders shall be designed, constructed, and maintained in accordance with the applicable provisions of the Unfired Pressure Vessel Safety Orders.

7.3.6 Maintenance Requirements.

A. SCUBA regulators, including first stages, second-stages and alternate second stage air sources, shall be inspected prior to initial use, serviced annually by a qualified service technician unless more frequent service is deemed necessary.
B. Depth gauges (stand-alone or integrated into dive computers) shall be tested every 6 months against a master reference gauge with no deviation greater than +3.0/-0.0 fsw between any two equivalent gauges.
C. Submersible pressure gauges shall be tested annually against a master reference gauge with no deviation greater than +/– 10 percent of scale.
D. Buoyancy compensator device inflator assemblies shall be serviced annually in accordance with the manufacturer's recommended guidelines.
E. SCUBA cylinders must be hydrostatically tested in accordance with U.S. Department of Transportation standards and be internally and externally inspected by a qualified technician annually or when suspect.
F. SCUBA cylinder valves shall be functionally inspected at intervals not to exceed 12 months.
G. Standby diver tending line (without communication wires) shall be pull-tested annually to a minimum of 300 pounds.
H. Weight-harness systems with quick-release mechanisms shall be tested for proper function prior to each diving day.

7.3.7 Use of NOAA-Issued Diving Equipment Off-Duty.

A. General.

1) In order to maximize the safe conduct of diving operations, NOAA divers are required to regularly train to maintain a high level of proficiency through the performance of diving activities on a routine basis.
2) In recognition of the important benefits of regular dive training with a uniform set of diving equipment, NOAA divers may use NOAA-issued diving equipment on off-duty dives for the purpose of maintaining diving proficiency. Such training helps maintain familiarity with the controls and function of the equipment, develop muscle memory needed to react automatically during emergencies, and promote physical fitness.

B. Minimum Requirements.

1) NOAA divers shall be authorized to dive by the NDP in order to use SEP gear off-duty. Divers whose diving proficiency has lapsed may participate in the off-duty program for the purpose of obtaining reauthorization with UDS approval.
2) Prior to using NOAA-issued diving equipment on off-duty dives, each diver must sign and comply with the NOAA Diver Agreement for the Use of SEP Gear Off-Duty and the SEP Off-Duty Liability Release available at www.ndc.noaa.gov. User Agreements and Liability Waivers are valid until December 31st of the year in which they are signed. Copies of these documents, with original signatures, shall be maintained at the Diving Unit by the UDS.
3) Divers using SEP equipment on off-duty dives must complete two of the following skills during each dive:
   a) Ditch and don BCD;
   b) Weight belt removal/replacement;
   c) Disconnect/reconnect inflators (BCD/Dry Suit);
   d) Drysuit roll outs and venting;
   e) Buddy breathing;
   f) Air sharing;
   g) Deploy and use RASS;
   h) Recover unconscious diver from water;
   i) Mask removal, replace and clear;
   j) Maintain neutral buoyancy for 2 minutes;
   k) Control descent/ascent rate;
   l) Underwater communication (hand signals);
   m) Underwater navigation and orientation; and/or
   n) Regulator recovery.
4) Completion of requirements in Section 7.3.7B3 above shall be noted on the SEP Off-Duty Proficiency Dive Skills Checklist and verified (in writing) by the diver's buddy following any off-duty dive with SEP gear. A copy of the signed checklist shall be forwarded to the UDS and kept on file at the unit for a minimum of 30-days or forwarded electronically to ndp.diveplans@noaa.gov.
5) All off-duty dives using SEP equipment shall be logged as "Training/Proficiency" and "Non-Duty" using the NDP online dive logging system available at www.ndc.noaa.gov.

C. Eligibility.

1) Only those NOAA divers in active status with the NDP and possessing SEP equipment are eligible to participate in the SEP off-duty diving program.
2) Only NOAA employees and approved contractors are eligible to participate in the SEP.

D. Authority for accepting divers into the SEP off-duty diving program.
   1) Authority for accepting divers into the SEP off-duty diving program rests with the UDS.
   2) The NOAA NDPM, LODO/SODO, or UDS may revoke approval for participation in this program for cause, at any time.
E. Limitations. Maximum depth and tasks authorized may be limited by the NDPM, LODO/SODO, or UDS based on review of the divers' resumes and dive logs.
F. Responsibilities.
   1) NOAA UDS.
      a) Reviews SEP NOAA Diver Agreement for the Use of SEP Gear Off-Duty and the SEP Off-Duty Liability Release for compliance with minimum requirements;
      b) Maintains records of NOAA Diver Agreement for the Use of SEP Gear Off-Duty and the SEP Off-Duty Liability Release for the duration of their validity and ensures SEP Off-Duty Proficiency Dive Skills Checklists are maintained for 30 days post-dive or forwarded electronically to ndp.diveplans@noaa.gov; and
      c) Monitors adherence to standards outlined in the NOAA Diver Agreement for the Use of SEP Gear Off-Duty and suspends SEP off-duty use if violations are detected.
   2) NOAA LODO/SODO.
      a) Reviews and grants approval for SEP off-duty equipment use for divers whose proficiency has lapsed by more than 6 months; and
      b) Monitors adherence to standards outlined in the NOAA Diver Agreement for the Use of SEP Gear Off-Duty and suspends SEP off-duty use if violations are detected.
   3) NOAA NDPM. Monitors adherence to standards outlined in the NOAA Diver Agreement for the Use of SEP Gear Off-Duty and suspends SEP off-duty use if violations are detected.

7.4 Tethered SCUBA Diving Equipment

7.4.1 Servicing and Testing. The following annual servicing and testing is required for all tethered SCUBA diving systems:
   A. All full-face masks used for tethered SCUBA diving must be serviced by a certified repair technician annually.
   B. The entire communication/strength tether, including the seizing of the "D" ring on the tether, must be visually inspected annually.

7.4.2 Documentation. Results of annual servicing and inspection shall be noted on the annual diving unit safety assessment checklist.

7.5 Surface Supplied Diving Equipment

7.5.1 Hookah Diving. Per 29 CFR 1910, Subpart T, hookah diving is prohibited under NOAA and OSHA auspices.

7.5.2 Masks and Helmets.

A. Surface-supplied and mixed gas masks and helmets shall have:
   1) A non-return valve at the attachment point between masks/helmets and hose which shall close readily and positively; and
   2) An exhaust valve.
B. Surface-supplied masks and helmets shall have a minimum ventilation rate capability of 4.5 acfm at any depth at which they are operated or the capability of maintaining the diver's inspired carbon dioxide partial pressure below 0.02 atmospheres absolute (ATA) when the diver is producing carbon dioxide at the rate of 1.6 standard liters per minute.
C. Helmets or masks connected directly to the dry suit or other buoyancy-changing equipment shall be equipped with an exhaust valve.

7.5.3 Breathing Gas Supply Hoses.

A. Breathing gas supply hoses shall:
   1) Have a working pressure at least equal to the working pressure of the total breathing gas system; (if HP bank is used, a relief valve must be downstream from the pressure reducing regulator);
   2) Have a rated bursting pressure at least equal to 4 times the working pressure;
   3) Be tested at least annually to 1.5 times their working pressure; and
   4) Have their open ends taped, capped, or plugged when not in use.
B. Breathing gas supply hose connectors shall:
   1) Be made of corrosion-resistant materials;
   2) Have a working pressure at least equal to the working pressure of the hose to which they are attached; and
   3) Be resistant to accidental disengagement.
C. Umbilicals shall:
   1) Be marked in 10 foot increments to 100 feet beginning at the diver's end, and in 50 foot increments thereafter;
   2) Be made of kink-resistant materials; and
   3) Have a working pressure greater than the pressure equivalent to the maximum depth of the dive (relative to the supply source) plus 100 psi.

7.5.4 Weights and Harnesses.

A. Divers shall be equipped with a weight belt or assembly capable of quick release.
B. Diver shall wear a safety harness capable of lifting the diver from the water to the platform (e.g., man-rated) and be configured with:
   1) A positive buckling device;
   2) An attachment point for the umbilical to prevent strain on the mask or helmet; and
   3) A lifting point to distribute the pull force of the line over the diver's body.

7.5.5 Buoyancy Control. A drysuit or other buoyancy-changing equipment not directly connected to the helmet or mask shall be equipped with an exhaust valve.

7.5.6 Gauges and Timekeeping Devices.

A. A timekeeping device and gauges indicating diver depth that can be read at the surface shall be available at each dive location.
B. All depth gauges shall be deadweight tested or calibrated against a master reference gauge every 6 months, and when there is a discrepancy greater than 2 percent of full scale between any two equivalent gauges.

SECTION 8: MEDICAL STANDARDS

8.1 Medical Standards and Procedures for NOAA Diving

8.1.1. General.

A. The information contained within this manual does not address all medical standards and procedures for diving under the auspices of NOAA.
B. The NOAA Diving Medical Standards and Procedures Manual (NDMSPM) provides uniform criteria and interpretation of physical qualification for diving duties and should be referred to for specific information on medical standards for NOAA diving.
C. The NDMSPM, which is based on standards from current dive medicine practice within a variety of government and civilian organizations, as well as experts in dive medicine, can be viewed and downloaded from the NDC website at www.ndc.noaa.gov.

8.1.2 Purpose. The NDMSPM was developed to ensure individuals diving under the auspices of NOAA are:

A. Free of contagious diseases or medical conditions likely to endanger the health or safety of themselves or other personnel in the course of their diving duties;
B. Medically capable of performing duties without significant aggravation of existing physical defects or medical conditions that compromise diver safety or performance;
C. Free of medical conditions or physical defects that would likely result in termination from the NDP for medical unfitness; and
D. Medically fit to perform the duties of a NOAA diver.

8.1.3 Scope.

A. The Standards contained in the NDMSPM apply to all personnel who are authorized to dive under the NDP.
B. NOAA reserves the right to deny diving privileges to anyone deemed unfit to dive by the NDMRB.
C. Medical Clearance Authority.
    1) Authority for medical clearance for diving resides with NOAA.
    2) Objective data and opinions from physicians and other medical practitioners shall be reviewed as input for decisions on NOAA fitness to dive; however, the ultimate decision authority on fitness to dive rests with the NDP DMO.

8.2 Medical Examinations

8.2.1 General Information.

A. All medical examinations must be conducted by a MD, DO, NP, or PA licensed in the United States.
B. Forms NF 56-69, NDP Report of Medical History, and NF 56-70, NDP Report of Physical Examination Form, must be completed, signed, and dated by the examiner at the time the physical examination is performed.

8.2.2 Examination Types, Timing, and Frequency of Medical Examinations.

A. Examination types.
    1) An initial medical examination is required of all new applicants for dive certification as well as for all NOAA divers whose certification has lapsed for more than 2 years.

2) Periodic medical examinations are required of all active NOAA divers.
3) The Annual Medical Status Report shall be completed by all divers and is due to the NDP DMO in the anniversary month of divers' current physical exams. An Annual Medical Status Report is not required the year a diver is due to complete a periodic medical exam.

B. Examination periodicity. The following standards apply to all NOAA dive physicals.

Age (in years) at time of last physical	Time between physicals
18-47	5 years
48	4 years
49	3 years
50-59	2 years
60+	1 year

C. Physical examination requirements (see NDMSPM).

8.2.3 Reciprocity Divers.

A. The NDCSB may authorize divers to participate in NOAA diving operations based on certification by external agencies with whom NOAA has written reciprocity agreements.
B. No review of medical records by the NDP is routinely required for these individuals. However, individuals for whom a specific independent reason exists to believe they may not be fit to dive, may be asked to provide additional medical information and justification prior to allowing the individual to dive with NOAA.

8.2.4. Observer Divers. Observer Diver candidates shall submit Form NF 56-76, NDP Observer Diver Medical History, signed by a MD, DO, NP, or PA licensed in the United States, to the NDP DMO for review and approval.

8.2.5 Recordkeeping.

A. All diver physical examinations and medical information are protected under the Privacy Act of 1974, 5 U.S.C. § 552a, Public Law No. 93-579, (Dec. 31, 1974).
B. The NDC shall maintain medical records for each NOAA Diver certified in a secure location.
C. All medically-related documents shall be sent to the attention of the NDP DMO. All documents so submitted shall be:
   1) Treated as confidential as required by federal privacy laws; and
   2) Retained in accordance with applicable federal statutes.
D. Availability of Records.
   1) Medical records shall only be released upon written authorization of the diver or former diver.
   2) Records and documents required by this standard shall be retained as outlined in Section 10.1.4 of this manual.

8.3 Reporting Changes in Medical Condition

8.3.1 Requirements.

A. Divers are responsible for immediately reporting information concerning changes to their medical qualifications for diving duty.
B. Any new medical condition other than minor acute episodic illness since completion of the diver's last history and/or physical must be reported immediately to the NDP DMO. This includes any surgery, no matter how minor complex, hospitalizations, fractures, or other injuries to bone or joint. If the NDP DMO determines that a diver is not medically qualified, the diver and the diver's UDS will be notified by the DMO.
C. Changes in medical condition must be reported on an annual basis on Form 56-77, NDP Annual Medical Status Report.

8.3.2 Consequences of Non-Disclosure.
A. Any evidence of either nondisclosure or falsification of medical information shall result in suspension of diving certification pending investigation by the NDCSB.
B. If the investigation reveals that the diver intentionally withheld or falsified information, his/her diving certification may be summarily terminated.

8.4 Lapsed Dive Physicals

8.4.1 Expiration of Diving Physicals.
A. NOAA Diver physical exams expire 12, 24, 36, 48, or 60 months from the date the physical exam was performed based on the age of the diver (Section 8.2.2).
B. If a diver's physical has lapsed for less than 24 months, they must submit a periodic physical with all required tests to the NDP DMO for assessment of fitness to dive.
C. If a diver's physical has lapsed for 24 months or longer, they shall be required to submit an initial physical with all required tests. The chest x-ray shall only be required at the discretion of the NDP DMO.

8.4.2 Annual Medical Status Report. Failure to submit an Annual Medical Status Report by the end of the month, which appears in the date box of the current physical exam, shall result in temporary suspension of diving privileges until such time as the form is submitted and reviewed.

8.5 Funding for NOAA Diving Physical Examinations

8.5.1 General.
A. In order to maximize the safe conduct of diving operations, NOAA divers are required to meet initial and periodic medical and fitness standards for diving.
B. In recognition of the important benefits of being medically and physically fit to dive, NOAA LOs/SOs are authorized to use government funds to cover costs associated with obtaining physical examinations for diving purposes.
C. In lieu of using government funds to pay for diving physical examinations, LO/SO may choose to require employees to obtain the examinations via their personal health insurance programs. In such cases, LO/SO may reimburse NOAA employees for costs not covered by their personal health insurance programs.

8.5.2 Eligibility.
A. In order to use government funds for the purpose of obtaining diving physical examinations, individuals must be NOAA employees, currently certified as NOAA

divers, or eligible to obtain NOAA diving certification, either initially or in a recertification program.

B. Use of Government funds to pay for diving physical examinations is limited to the following classifications of NOAA federal employees: NOAA Corps Officers, and Commerce Alternate Pay System, Wage Grade, and Wage Marine employees.

8.5.3 Authority for Approving Government Funding of NOAA Diving Physicals Exams. Final authority to expend government funds for the purpose of obtaining diving physical examinations rests with the appropriate LO/SO unit, program, or ship official.

8.5.4 Responsibilities.

A. NOAA Diver or Diver Candidate. Discusses funding options with appropriate Unit Diving Supervisor (UDS) and NOAA funding manager.

B. NOAA Unit Diving Supervisor.
   1) Participates in discussion on funding options with diver, or diver candidate, and NOAA funding manager; and
   2) Provides input on funding option to appropriate funding manager.

C. NOAA Funding Manager.
   1) Participates in discussion on funding options with diver, or diver candidate, and UDS; and
   2) Notifies diver, or diver candidate, and UDS of decision.

SECTION 9: EMERGENCY PROCEDURES

9.1 Dive Accident Management

9.1.1 General.

A. Dive accident management includes accident prevention and the development of a Diving Emergency Assistance Plan that includes procedures for the emergency care of victims after an accident.

B. Diving accident management involves activating a DEAP that includes, but is not limited to:

1) Stabilization of life sustaining functions;
2) Administering oxygen; and
3) Contacting medical personnel and suggested services for assistance and advice.

9.1.2 Diving Emergency Procedures.

A. The DM or LD shall have the ultimate on-site authority for management of diving related accidents and injuries, unless a DMO or DMT is available.

B. Each DM or LD shall develop a DEAP.

1) A standardized form (NOAA Diving Emergency Assistance Plan) template has been developed for this purpose (Appendix 4). An electronic version can be downloaded from the NDC website at www.ndc.noaa.gov.
2) The DEAP shall be submitted to the UDS as follows:
   a) Annually, as specified by the UDS; or
   b) If the DEAP changes for any reason (e.g., diving is conducted in a different geographic region).
3) An approved copy of the DEAP shall be made available to all divers and support personnel at the dive location for the duration of the operation.
4) UDS shall submit a copy of each unique DEAP to ndp.diveplans@noaa.gov.

9.1.3 Medical Consultation.

A. Medical advice shall be sought from a qualified health care provider at the first sign or report of a hyperbaric related injury or illness.

B. Medical advice from a qualified health care provider shall only be changed or modified when:

1) Contradicting instructions are received from a consulting DMO or hyperbaric physician; or
2) Life threatening situations requiring immediate on-site deviation. A written record of the deviation shall be made and the NDP DMO briefed as soon as possible after the change.

C. Initial consult for NOAA related diving maladies shall be attempted with the NDP DMO.

D. Secondary consult for NOAA related diving maladies when the NDP DMO is not available.

1) NOAA ships with a DMO onboard may consult with the on-call DMO at the Navy Diving and Salvage Training Center or Navy Experimental Dive Unit (NEDU), Panama City, FL.
2) NOAA ships without a DMO onboard shall consult with the on-call DMO at the NDCSTC or NEDU.
3) All other units shall contact DAN, Durham, NC.

E. Contact information for both the primary and secondary consults shall be listed on the DEAP and verified prior to commencing diving operations.

F. The NOAA Dive Accident Management Field Reference Guide should be used to document information needed to relay to the NDP DMO prior to establishing communications with medical personnel. An electronic version can be downloaded from the NDC website at www.ndc.noaa.gov.

9.2 Emergency Protocols

9.2.1 General Procedures for Treatment of Hyperbaric Maladies.

A. Details on how to diagnose and report hyperbaric maladies can be found in the NOAA Dive Accident Management Field Reference Guide.
B. Treatment for hyperbaric maladies will be performed in accordance with current medical standards as prescribed by the NDP DMO.
C. Qualified personnel within the scope of their training and certification level/status are authorized to perform the protocols listed in this section as indicated for signs or symptoms of decompression illness.

9.2.2 Medical Instructions for Conscious Patients. The following procedures may be used for the treatment of a conscious diver when a DMO is not available at the dive location and the provider is trained in these procedures:

A. Check ABC's;
B. Administer 100 percent oxygen;
C. Remove exposure suit, dry patient, and keep warm;
D. Place patient in position of comfort;
E. Take vital signs every 5 minutes if unstable and every 15 minutes if stable;
F. Gather dive history info from diver, buddy and/or eyewitnesses;
G. Perform field neurological exam;
H. Contact NDP DMO and Emergency Medical Services (EMS) as soon as possible;
I. Administer 0.5 liters of water orally per hour for 2 hours, and then reduce to 100-200 milliliters (ml) per hour thereafter;
J. If unable to drink sufficient quantities of fluids orally, start IV with Lactated Ringers or Normal Saline (0.9 percent NaCl), and administer 0.5 liters per hour for 2 hours, then reduce to 100-200 ml per hour thereafter; and
K. If unable to urinate 30 cc/hour voluntarily, insert Foley catheter and monitor urine output quantity and appearance.

9.2.3 Medical Instructions for Unconscious Patients. The following procedures may be used for the treatment of an unconscious diver when a DMO is not available at the dive location and the provider is trained in these procedures:

A. Check ABC's;
B. Administer 100 percent oxygen;
C. Remove exposure suit, dry patient, and keep warm;
D. Place patient in lateral recumbent position;
E. Take vital signs every 5 minutes if unstable and every 15 minutes if stable;
F. Gather dive history info from dive buddy and/or eyewitnesses;
G. Perform field neurological exam and Glascow Coma Scale evaluation;
H. Contact NDP DMO and EMS as soon as possible;
I. Start IV with Lactated Ringers or Normal Saline; administer 0.5 liters per hour for 2 hours; then reduce to 100-200 ml per hour thereafter; and
J. Insert Foley catheter and monitor urine output quantity and appearance.

9.2.4 No Hyperbaric Chamber at Dive Location. If there is no hyperbaric chamber available at the dive location, initiate the following protocol:

A. Conduct field neurological exam and gather data for medical consultation;
B. Administer 100 percent oxygen;
C. Contact medical personnel for assistance and advice as soon as possible as outlined in Section 9.1.3;
D. Administer medications, drugs, and fluids as directed by the NDP DMO, or designee;
E. Follow other specific directions, recommendations, and precautions concerning the treatment and/or evacuation as medically directed or within the scope of training and certification level/status;
F. If there is a change in signs or symptoms after 30 minutes of oxygen breathing, continue 100 percent oxygen, consult a diving physician, and begin evacuation to a hyperbaric chamber; and
G. If there is no change in signs or symptoms after 30 minutes, the diver may be taken off oxygen and observed for one hour. Re-examine diver every 2-6 hours thereafter.

9.2.5 Hyperbaric Chamber at Dive Location. The following procedures may be used for the treatment of decompression illness in the event a qualified DMO is not available at the chamber:

A. Type I Decompression Sickness (DCS).
    1) Place diver on 100 percent oxygen and contact the NDP DMO, or designee, for instructions prior to pressurizing the diver in a hyperbaric chamber.
    2) If neither the NDP DMO nor his/her designee can be contacted immediately, or signs or symptoms indicate progression to Type II DCS, pressurize diver to 60 fsw (2.8 ATA) and begin a USN TT6. If still unable to contact the NDP DMO, or designee, continue USN TT6 until completion and then inform DMO as soon as possible.
B. Type II DCS or Arterial Gas Embolism (AGE).
    1) Place diver on 100 percent oxygen and immediately pressurize diver to 60 fsw (2.8 ATA) and begin a USN TT6. Contact the NDP DMO, or designee, as soon as possible for further instructions.
    2) If neither the NDP DMO nor his/her designee can be contacted, continue USN TT6 until completion and then inform DMO as soon as possible.
C. Standing medical orders for divers undergoing hyperbaric treatment.
    1) If the diver is able to take oral fluids but is not voiding at least 60-90 cc per hour (2-3 ounces), increase fluid intake.
    2) If the diver is unable to take oral fluids, start IV with Lactated Ringers or Normal Saline and administer 500 cc stat, and then infuse at 100-125 cc per hour.
    3) If diver is uncooperative or unable to void, start a Foley catheter with urine output goal of 60-90 cc/hour (2-3 ounces), increase fluid intake if necessary.
    4) Repeat field neurological exam every 15 minutes during the treatment.
    5) If victim is unconscious and does not regain consciousness once at depth, start a NG tube.

9.2.6 Guidelines for Non-Standard Scenarios. The following guidelines are provided to aid the chamber supervisor/operator and DMO in responding to non-standard problems that are not addressed elsewhere.

A. Inability to equalize ears during pressurization of the chamber.
    1) Type I DCS.
        a) Stop descent, ascend a few feet and try equalizing.

b) If still unable to clear after several tries, return chamber to surface and administer a nasal decongestant spray.
c) Wait until patient is able to auto-inflate their middle ear, then repeat attempt of pressurization in chamber.

2) Type II DCS or AGE.
a) Conscious victim: Depending on the symptoms the chamber supervisor may elect to try one or more of the steps listed above.
b) Unconscious victim: Do not delay; begin pressurization to 60 fsw in the chamber immediately.

B. Confined Space Anxiety Syndrome (Claustrophobia).
1) Try to calm and reassure patient; and
2) If necessary, the DMO may direct the administration of an anti-anxiety agent to the patient orally.

9.2.7 Post-Treatment Procedures.
A. Repeat neurological exams should be conducted at the conclusion of treatment followed by exams 1 and 6 hours following treatment and intervals of 6 hours thereafter, or as advised by the consulting DMO, until diver is seen by a physician.
B. Patients treated for Type I decompression sickness symptoms with complete resolution will be advised to report to a medical facility for medical examination upon completion of the recompression treatment.
C. Immediate transportation of the patient to a medical facility for medical examination following hyperbaric treatment is required when:
1) Directed by the consulting DMO;
2) Treatment was for Type II or AGE symptoms; or
3) Residual symptoms continue after treatment.

9.2.8 Temporary Suspension from Diving.
A. Divers treated for Type I and Type II decompression sickness shall not engage in diving activities involving hyperbaric exposures until approved (in writing) by the NDP DMO.
B. For further guidance on returning to diving after decompression sickness, refer to the NDMSPM.

9.2.9 Other Emergency Considerations. In addition to diving concerns, DMs and LDs should also consider emergency procedures for fire fighting, adverse environmental conditions, illness, and injury and include these in their dive planning and pre-dive briefing.

SECTION 10: RECORDKEEPING AND REPORTING REQUIREMENTS

10.1 Recordkeeping

10.1.1 General. The NDC shall maintain permanent records for each certified NOAA Diver including, but not limited to:

A. Evidence of certification level;
B. Training;
C. Log sheets;
D. Results of current physical examination;
E. Reports of disciplinary actions by the NDCSB;
F. First aid, CPR, including adult AED, and oxygen delivery certifications; and
G. Other pertinent information deemed necessary by the NDCSB.

10.1.2 Unit Training Log. Each unit shall maintain a current record of training conducted at the unit level for ease of tracking and verification.

10.1.3 Availability of Records.

A. Upon the request of the Assistant Secretary of Labor, or the Director, National Institute for Occupational Safety and Health, Department of Health and Human Services or their designees, the employer shall make available for inspection and copying any record or document required by this standard.
B. Records and documents required by 29 CFR 1910, Subpart T, shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with 29 CFR 1910.1020 (a)-(e) and (g)-(i) (in 1996, 29 CFR 1910.20 was re-designated as 29 CFR 1910.1020).
C. Safe practices manuals (29 CFR 1910.420), depth-time profiles (29 CFR 1910.422), decompression procedure assessment evaluations (29 CFR 1910.423), and records of hospitalizations (29 CFR 1910.440) shall be provided in the same manner as employee exposure records or analyses using exposure or medical records.
D. Equipment inspections and testing records which pertain to employees (29 CFR 1910.430) shall also be provided upon request to employees and their designated representatives.
E. Except as prohibited by the Health Insurance Portability and Accountability Act privacy rule or other law, copies of NDC records are available for review by the NDSO, SECO, NDC personnel, and the NDP chain of command.
F. Medical records belonging to an individual diver or former diver shall be made available to that individual upon written request.
G. Medical records may also be provided to the attending physician of a diver or former diver when released in writing by the diver.

10.1.4 Retention of Records.

A. The following records shall be retained for the following minimum periods:

Record	Period at NDC	Period at Diving Units
Pre- and Post-Dive Checklists	3 years if included in a Diving Incident Report Case File then forwarded to Federal Record Center and kept for 72 years then destroyed	24 hours post operation except following a reportable diving injury and then include in Diving Incident Report Case File
Dive Plan	1 year except following a reportable diving injury then included in Diving Incident Report Case File	24 hours post operation then forward to ndp.diveplans@noaa.gov
Diving Emergency Assistance Plans	1 year except following a reportable diving injury then included in Diving Incident Report Case File	Filed at ndp.diveplans@noaa.gov on an annual basis or when the information on the DEAP changes (e.g., geographically or seasonally).
Diver Medical Records	3 years then forwarded to Federal Record Center and kept for 72 years then destroyed	
NOAA Diving Standards and Safety Manuals	Current and all previous manuals	Current manual only
On-site Supervisor's Dive Log	Permanently	24 hours post operation
On-line Dive Log	Permanently	
Dive Incident Report	Permanently	
Equipment inspection and Testing	Current entry or until removed from service except following a reportable diving injury then included in Diving Incident Report Case File	Current entry or until removed from service except following a reportable diving injury then included in Diving Incident Report Case File
Records of Hospitalizations	Permanently	
SEP Off-Duty Proficiency Dive Skill Checklist	3 years if included in a Diving Incident Report Case File then forwarded to Federal Record Center and kept for 72 years then destroyed	30 days post dive except following a reportable diving injury and then include in Diving Incident Report Case File
NOAA Diver Agreement for Use of NOAA Issued Diving Equipment Off-Duty	3 years if included in a Diving Incident Report Case File then forwarded to Federal Record Center and kept for 72 years then destroyed	30 days post dive except following a reportable diving injury and then include in Diving Incident Report Case File

Record	Period at NDC	Period at Diving Units
Assumption of Risk and Release of Liability for Use of SEP gear Off-Duty	3 years if included in a Diving Incident Report Case File then forwarded to Federal Record Center and kept for 72 years then destroyed	30 days post dive except following a reportable diving injury and then include in Diving Incident Report Case File

B. After the expiration of the retention period of any record, the record may be further retained or destroyed at the discretion of the NDPM and in accordance with 29 CFR 1910.20 (h) and the appropriate NOAA Records Disposition Schedule.
C. In the event that NOAA ceases to do business:
   1) The successor employer shall receive and retain all dive and employee medical records required by this standard; or
   2) If there is no successor employer, dive and employee medical records shall be forwarded to the National Institute for Occupational Safety and Health, Department of Health and Human Services.

10.1.5 Logging of Dives.

A. The NDP Supervisor's Dive Log (or analogous form) must be used to log all duty dives and must be kept on site for no less than 24 hours post operation.
B. All NOAA divers are required to log all official dives and are encouraged to log all non-duty dives.
C. Dives are to be logged as soon as possible after completion using the web-based recording system available on the NDP website at www.ndc.noaa.gov.
D. Non-duty dives performed to fulfill diving proficiency requirements shall also be logged.
E. A dive is defined as the time spent breathing compressed gas underwater or in a hyperbaric chamber and is considered completed when an individual returns to surface pressure and remains for a minimum of 10 minutes.
F. The following information shall be recorded and maintained for each diving operation:
   1) Names of dive team members including Divemaster or Lead Diver;
   2) Date, time, and location;
   3) Diving modes used;
   4) Breathing gases used;
   5) Type of dive (i.e., Working or Scientific);
   6) Type of equipment used;
   7) Dive platform;
   8) Tasks performed;
   9) Approximate underwater and surface conditions (visibility, water temperature, and current);
   10) Maximum depth and bottom time for each diver;
   11) Decompression mode (tables or dive computer); and
   12) Whether or not a safety stop was performed.

10.2 Reporting Diving Incidents

10.2.1 General.

A. All diving related incidents shall be investigated, documented, and reported to NOAA management in accordance with NAO 209-1 and NAO 209-123. Both policies are available online at SECO and NDC websites respectively.

B. Reporting requirements vary with incidents involving injury or non-injury.
C. All diving related incidents and near-misses occurring while performing official NOAA duties shall be reported to SECO via their website, www.seco.noaa.gov with the exception of OMAO vessels which will use MOC-137.

10.2.2 Reportable Diving Injuries.

A. NOAA shall record the occurrence of any diving related injury or illness requiring medical treatment beyond basic first aid, specifying the circumstances of the incident and the extent of any injuries or illnesses.
B. NOAA shall record and report occupational injuries and illnesses in accordance with NOAA incident reporting procedures.
C. If pressure related injuries are suspected, or if symptoms are evident, the following additional information shall be recorded and retained with the record of the dive for a period of 5 years by the NDC:
    1) NOAA Dive Incident Report form, and
    2) Written descriptive report to include:
        a) Name, address, phone numbers of principal parties involved;
        b) Summary of experience of divers involved;
        c) Location, description of dive site, and description of conditions that led up to incident;
        d) Description of symptoms, including depth and time of onset;
        e) Description and results of treatment;
        f) Disposition of case; and
        g) Recommendations to avoid reoccurrence of similar incident.
D. Examples of reportable diving injuries include:
    1) Fatalities;
    2) Injuries requiring hyperbaric therapy (e.g., decompression sickness and lung overexpansion injuries); and
    3) Injuries requiring hospitalization of 24 hours or more, medical care beyond basic first aid, or that impair an individual's ability to dive for more than 48 hours.
E. Reporting procedures.
    1) Divers shall:
        a) Notify the DM or LD immediately at the first sign or symptom of any injuries sustained during diving operations;
        b) Notify immediate work supervisor; and
        c) Complete the employee section of the Office of Worker's Compensation Programs (OWCP) Form CA-1 (Federal employees only) and forwards it to immediate work supervisor within 24 hours of being released from medical care. Note: NOAA Corps Officers who suffered an injury not required to submit an OWCP CA-1 form.
    2) Immediate work supervisors shall:
        a) Report the incident via the on-line NOAA Accident/Incident Reporting Form (www.seco.noaa.gov) or the MOC-137 when occurring on an OMAO vessel, within 24 hours of the incident; and
        b) Complete the supervisors section of the Form CA-1 (For NOAA employees, with the exception of NOAA Corps Officers, and where medical costs were incurred) and forward all original documents to Contract Claims Services, Inc. for processing.
    3) Divemasters and Lead Divers shall:
        a) Immediately notify their respective UDS of the reportable injury; and

b) Submit a written incident report to their UDS within 7 calendar days of the reportable injury.

4) UDSs shall:
   a) Immediately notify their respective LODO/SODO of the reportable injury; and
   b) Submit a detailed analysis and report of the reportable injury to the respective LODO/SODO within 7 calendar days of receipt of report.
   c) The reports shall include, but not be limited to, the following: nature of the operations, existing environmental conditions, dive profiles, dive plans, personnel involved, type of equipment used, nature of any equipment failures, causal analyses, recommendations for prevention of future injuries, a copy of the DM's or LD's incident narrative, a copy of any relevant medical records from treatment received from the treated diver, a copy of the NDP Dive Incident Report, and a copy of the SECO on-line incident report.
5) LODOs/SODO (or DLODOs/DSODO) shall:
   a) Immediately notify the NDPM of the reportable injury;
   b) Conduct a fact-finding investigation into the incident and forward final report to the NDPM within 10 calendar days of receipt of report from UDS; and
   c) Include a copy and an analysis of the report submitted by the UDS, a conclusion as to the cause of the incident, and a corrective action plan (if deemed appropriate).
6) NDPM shall:
   a) Review the report for completeness and any immediate mitigation actions required to prevent a similar event from occurring: and
   b) Forward copy of report to the Chairs of the NDCSB and NDMRB, and NDSO for review within 7 calendar days of receipt of report from LODO/SODO.
7) Chair of the NDMRB shall:
   a) Forward copies of the report to the members of the NDMRB within 7 calendar days of receipt of report from NDPM;
   b) Consolidate comments received from NDMRB members; and
   c) Forward comments to the NDPM and Chair, NDCSB.
8) Chair of the NDCSB shall:
   a) Forward copies of the report to the members of the NDCSB within 7 calendar days of receipt of report from NDPM;
   b) Consolidate comments received from the NDCSB members;
   c) Obtain consensus from the NDCSB of any corrective actions required;
   d) Discuss incident and corrective actions during next monthly meeting of the NDCSB; and
   e) Direct the NDPM to implement any corrective actions determined by the NDCSB.

10.2.3 Reportable Diving Incidents Not Involving Injuries.

A. General.
   1) Occasionally incidents occur that do not involve reportable injuries, but warrant awareness by NOAA officials.
   2) Examples of such incidents include:
      a) Diving equipment malfunction or failure;
      b) "Near miss" or "close call" incidents that could have resulted in a fatality or serious injury to a diver or topside support personnel;
      c) Any action that jeopardized a diver's safety or that of a dive buddy; or
      d) Evidence of poor judgment by a NOAA diver or supervisor.

B. Reporting Requirements.
   1) It is the duty and responsibility of anyone experiencing or observing a diving related incident, such as one of those listed above, to immediately report the incident to the DM or LD.
   2) The DM or LD shall:
      a) Report the incident to the UDS within 24 hours of the occurrence;
      b) If warranted, initiate a safety "stand-down" to review the incident and determine: what happened, why did it happen, what corrective actions are needed to mitigate a similar incident, and if and when dive operations can resume.
   3) The UDS will file a "near-miss" incident report using on-line the NOAA Accident/Incident Reporting Form (www.seco.noaa.gov) within 24 hours of receiving the report from the DM or LD.
   4) If the incident occurs on an OMAO vessel, the incident will also be reported via MOC-137.

APPENDIX 1

ACRONYMS AND INITIALISMS

ABCs	Airway, Breathing Circulation
acfm	actual cubic feet per minute
AED	Automated External Defibrillators
AGE	Arterial Gas Embolism
ASME	American Society of Mechanical Engineers
ATA	Atmospheres Absolute
BCD	Buoyancy Compensator Devices
BIBS	Built-In-Breathing System
CAO	Chief Administrative Officer
CAP	Corrective Action Plan
CFR	Code of Federal Regulations
CPR	Cardiopulmonary Resuscitation
DAN	Divers Alert Network
DCS	Decompression Sickness
DEAP	Diving Emergency Assistance Plan
DO	Diving Officer
DOC	U.S. Department of Commerce
DM	Divemaster
DMO	Diving Medical Officer
DMT	Diver Medical Technician
DPIC	Designated Person-In-Charge
DSO	Diving Safety Officer
DUI	Diving Unlimited International
DUSA	Diving Unit Safety Assessment
EMS	Emergency Medical Services
fsw	Feet of seawater (or equivalent static pressure head)
HP	High Pressure
LD	Lead Diver
LODO/SODO	Line/Staff Office Diving Officers
LOR	Letter of Reciprocity
MD	Medical Doctor
NAO	NOAA Administrative Order
NBDHMT	National Board of Diving and Hyperbaric Medical Technology
NDC	NOAA Diving Center
NDCM	NOAA Diving Center Manager
NDCSB	NOAA Diving Control and Safety Board
NDMO	NOAA Diving Medical Officer
NDMRB	NOAA Diving Medical Review Board
NDMSPM	NOAA Diving Medical Standards and Procedures Manual
NDP	NOAA Diving Program
NDPM	NOAA Diving Program Manager
NDSO	NOAA Diving Safety Officer
NEDU	Navy Experimental Dive Unit
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service

NP	Nurse Practitioner
OAR	Oceanic and Atmospheric Research
OMAO	Office of Marine and Aviation Operations
OPM	Office of Personnel Management
OSHA	Occupational Safety and Health Standards
PA	Physician's Assistant
psi	Unit of pressure, "pounds per square inch"
psig	Unit of pressure, "pounds per square inch gauge"
RASS	Reserve Air Supply System
SCUBA	Self-Contained Underwater Breathing Apparatus
SECO	NOAA Safety and Environmental Compliance Office
SEP	Standardized Equipment Program
SODO	Staff Office Diving Officer, i.e., the OMAO Diving Officer
STE	Special Task Endorsement
TT	U.S. Navy Treatment Table
UDS	Unit Diving Supervisor
USC	U.S. Code
USN	U.S. Navy
WFMO	Workforce Management Office

APPENDIX 2

DEFINITIONS

As used in this manual, the listed terms are defined as follows:

Air sharing: Sharing of a single air supply between divers who are using independent second stages.

ASME Code or equivalent: American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section VIII, or an equivalent code which NOAA can demonstrate to be equally effective.

ATA: "Atmospheres Absolute", total pressure exerted on an object, by a gas or mixture of gases, at a specific depth or elevation, including normal atmospheric pressure.

Bell: An enclosed compartment, pressurized (closed bell) or unpressurized (open bell), which allows the diver to be transported to and from the underwater work area and which may be used as a temporary refuge during diving operations.

BIBS: Built-In-Breathing System. A breathing mask, typically found in hyperbaric chambers, which allows the wearer to breathe a gas (typically oxygen) other than that present in the adjacent environment. Exhaled gases are removed from the adjacent environment via a separate hose from that which supplies the inhalation gases.

Bottom Time: The total elapsed time measured in minutes from the time when the diver leaves the surface in descent to the time that the diver begins a direct ascent to the surface.

Breath-hold Diving: A diving mode in which the diver uses no self-contained or surface-supplied breathing gas supply.

Buddy Diver: A second comparably equipped SCUBA diver in the water in constant communication with the first diver and ready to render immediate assistance in an emergency.

Buddy System: A system utilizing two or more divers in which all divers are comparably equipped in the water and in constant communication.

Bursting Pressure: The pressure at which a pressure containment device would structurally fail.

Certified Diver: A diver who holds a valid certification from an organizational member or internationally recognized certifying agency.

Controlled Ascent: Any one of several kinds of ascents including normal, swimming, and air sharing ascents where the diver(s) maintain control over the rate of ascent.

Cylinder: A pressure vessel for the storage of gases.

Decompression Sickness: A condition with a variety of symptoms which may result from gas bubbles in the tissues of divers after pressure reduction.

Decompression Table: A profile or set of profiles of depth-time relationships for ascent rates and breathing mixtures to be followed after a specific depth-time exposure or exposures.

Designated Person-in-Charge (DPIC): A person designated by the DM or LD who is at the dive location, and in charge of all aspects of the dive operation affecting the safety and health of the dive team members.

Dive: Time spent underwater breathing compressed gas.

Dive Computer: A microprocessor based device which calculates a diver's theoretical decompression status, in real time, by using pressure (depth), breathing gas composition, and time as inputs to a decompression model, or set of decompression tables, programmed into the device.

Dive Location: A surface or vessel from which a diving operation is conducted.

Dive-Location Reserve Breathing Gas: A supply system of breathing gas at the dive location which is independent of the primary supply system and sufficient to support divers during the planned operation.

Dive Site: Physical location of a diver during a dive.

Divemaster: NOAA divers assigned by the NOAA LO/SO UDS to oversee and direct all aspects of a dive operation affecting the safety and health of the dive team members at the dive site.

Dive Team: Divers directly involved in a diving operation including the DPIC and Tenders.

Diver: Individuals certified by the NDPM to dive and perform work in a hyperbaric environment in support of NOAA's mission. These include NOAA employees (Full and Part-Time Equivalent), contract employees, reciprocity, observer, and volunteer divers.

Diver-Carried Reserve Breathing Gas: A diver-carried supply of breathing gas sufficient under standard operating conditions to allow the diver to safely reach the surface, or another source of breathing gas, or to be reached by another diver.

Divers Alert Network (DAN): A 501(c)(3) non-profit medical and research organization dedicated to the safety and health of recreational SCUBA divers and associated with Duke University Medical Center.

Diving Mode: A type of diving requiring specific equipment, procedures and techniques (e.g., SCUBA or surface-supplied).

Diving Safety Officer, NOAA (NDSO): Individual responsible for monitoring the safe conduct of the NDP and providing advice to the NDCSB and senior NOAA Management on all diving safety and health related issues.

DLODO: Deputy Line Office Diving Officer.

DSODO: Deputy Staff Office Diving Officer.

HP: Usually refers to pressures greater than 150 psig, "High Pressure."

Heavy gear: Diver-worn deep-sea dress including helmet, breastplate, drysuit, and weighted shoes.

Hookah: Diving mode similar to surface supplied diving in that the breathing gas is supplied from the surface by means of a pressurized hose. The supply hose does not require a strength member, pneumofathometer hose, or communication line. Hookah equipment may be as simple as a long hose attached to a standard SCUBA cylinder supplying a standard SCUBA second stage. The diver is responsible for the monitoring of his/her depth, time, and diving profile.

Hyperbaric Chamber: A pressure vessel designed for human occupancy, also called a decompression chamber or recompression chamber.

Hyperbaric Conditions: Pressure conditions in excess of surface pressure.

Low Pressure: Usually refers to pressures less than 150 psig, “Low Pressure.”

Low Visibility: When visual contact with the dive buddy can no longer be maintained.

Lead Diver: Certified diver with experience and training to conduct a diving operation. In the absence of a DM, oversees dive operations at the discretion of a UDS.

Liveboating: The practice of supporting a surfaced supplied diver from a vessel which is underway.

LODO: Line Office Diving Officer; senior representatives for diving from NOAA Line Offices.

Mixed Gas: A breathing gas other than air.

Nitrox: Any gas comprised predominately of nitrogen and oxygen with an oxygen content greater than air, most frequently containing between 21 percent and 40 percent oxygen.

NOAA Appointing Officer: Individual with authority to approve the hiring of NOAA employees.

NOAA Deputy Line/Staff Office Diving Officers: Individuals who assist Line/Staff Office Diving Officers in overseeing and directing diving activities within specific NOAA LOs/SO and serve as voting members of the NDCSB.

NOAA Diving Control and Safety Board (NDCSB): An appointed NDCSB of representatives from the NOAA LOs/SO that reports to the OMAO Director, and has authority over and promotes the safe and effective operations of the NDP.

NOAA Diving Manual: Refers to the NOAA Diving Manual, Diving for Science and Technology, National Oceanic and Atmospheric Administration, Office of Undersea Research, US Department of Commerce.

NOAA Diving Medical Officer: Health care provider assigned to the NDP to provide medical care and advice in support of the NDC and NDP.

NOAA Diving Medical Review Board (NDMRB): A standing committee of a minimum of five (5) qualified hyperbaric physicians who advise the diving program on various dive-related medical issues.

NOAA Diving Program (NDP): Group consisting of the NDPM, NDCSB, NDSO, NDCM, LODOs/ SODO, UDSs, DMs and divers who ensure that all NOAA diving operations are conducted safely, efficiently and economically.

NOAA Diving Program Manager: Individual responsible for managing the day-to-day affairs of the NDP and serving as the ranking NOAA diving official for matters relating to the interpretation and application of the NOAA Diving regulations, standards, policies, and procedures.

NOAA Diving Safety Officer: Individual responsible for advising the NDCSB, NOAA managers, and divers for diving safety and health related issues.

NOAA Funding Manager: Individual with authority to approve the expenditure of Government funds.

NOAA Line/Staff Office Diving Officers: Individuals who oversee and direct diving activities within specific NOAA LOs/SO and serve as voting members of the NDCSB.

NOAA Volunteer Divers: Individuals that perform diving services for NOAA on their own initiative without a formal request.

NOAA Working Diving Standards and Safety Manual (NWDSSM): Specific policies and procedures for conducting working diving operations under the auspices of NOAA.

No-Decompression Limits: Depth-time limits of the “no-decompression limits and repetitive dive group designations table for no-decompression air dives” of the U.S. Navy Diving Manual or equivalent limits.

Observer Diver: NOAA program sites are frequently visited by representatives of other agencies, the media, and various officials for the purpose of familiarization, evaluation, or reporting on NOAA programs. The Observer Diver classification was established to allow these divers to observe diving activities conducted by NOAA.

Oxygen Service: A gas delivery system that is both oxygen clean and oxygen compatible.

Pressure-Related Injury: An injury resulting from pressure disequilibrium within the body as the result of hyperbaric exposure. Examples include: decompression sickness, pneumothorax, mediastinal emphysema, air embolism, subcutaneous emphysema, or ruptured eardrum.

Pressure Vessel: See cylinder.

PSI: Unit of pressure, “pounds per square inch.”

PSIG: Unit of pressure, “pounds per square inch gauge.”

Reserve Air Supply System (RASS): A diver-carried auxiliary supply of air, sufficient under standard operating conditions to allow the diver to reach the surface, or another source of breathing gas, or to be reached by a standby diver.

Redundant Second Stage Regulator: An additional second stage regulator that is attached to the diver’s BCD inflator assembly and is used in the event a dive buddy needs to share air or the diver’s primary second stage malfunctions.

Restricted Visibility: Underwater conditions such as turbidity or darkness which prevent divers from easily seeing their dive buddy, gauges or dive site.

Scientist: Individual who utilizes scientific expertise to perform dives without direct or indirect supervision or guidance from a more qualified individual as determined by the on-site DM/LD and Chief Scientist.

Scientific Diver: A diver who has been authorized by the NDPM, to conduct dives in support of NOAA's science activities.

Scientific Diving: Dives performed solely as a necessary part of a scientific, research, or education activity by individuals whose sole purpose for diving is to perform scientific or research tasks for the advancement of science. SCUBA Diving: A diving mode independent of surface supply in which the diver uses an open circuit self-contained underwater breathing apparatus.

SODO: Senior representative for diving from the OMAO.

Standby Diver: A diver at the dive location appropriately equipped and able to enter the water within 1 minute to assist another diver.

Surface Supplied Diving: A diving mode where the breathing gas is supplied from the surface by means of a pressurized umbilical hose. The umbilical generally consists of a gas supply hose, strength member, pneumofathometer hose, and communication line. The umbilical supplies a helmet or full-face mask. The diver may rely on the tender at the surface to keep up with the diver's depth, time and diving profile.

Tether: A safety line between the diver and the surface used for communications (voice or line-pulls) and retrieval of the diver in an emergency.

Treatment table: A depth-time and breathing gas profile designed to treat decompression sickness.

Umbilical: The composite hose bundle between a dive location and a diver or bell, or between a diver and a bell, which supplies the diver or bell with breathing gas, communications, power, heat, or cooling as appropriate to the diving mode or conditions, and includes a safety line between the diver and the dive location.

Unit Diving Supervisor (UDS): NOAA divers appointed by a NOAA LO/SO to oversee, direct, and approve diving activities conducted within their respective unit and to administer to the needs of assigned divers.

Working Pressure: The maximum pressure to which a pressure containment device may be exposed under standard operating conditions.

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APPENDIX 3

NOAA DIVING PROGRAM - DIVE OPERATIONS PLAN

Date(s) of Operations:		Time of Operations:	
Location of Operations:		Number of Divers:	
Distance from Shore:		Planned # of Dives per Day:	
Evac. Time to Chamber:		Max Possible # of Dives to be Logged/Day:	
Depth Range of Dive Ops:		Number of Consecutive Dive Days:	
Platform:		On-Duty Dive ☐	Off-Duty Dive w/SEP gear ☐

Scientific Dive (meets all criteria) ☐ Working Dive ☐	Float Plan Required Yes ☐ No ☐	Safe Ship Checklist Required Yes ☐ No ☐

Diving Mode:	SCUBA ☐ Surface Supplied ☐	Decompression Calculation Method:	Dive Computer ☐ Decompression Tables ☐

Divemaster / Lead Diver:

Divers:

Purpose of dives and tasks to be performed:

Principal Diver-Worn Equipment & Breathing Media:

Tools / Specialized Equipment to be Used:

Potential Hazards & Mitigations:

Certain hazards are present on all dives (AGE, DCS, drowning, etc.), the above are unique to this operation.

Primary means of Evacuation for Emergencies:

Submitted by: (Print)		**Signature:**		**Date:**	
Reviewed by: (Print) UDS or Designee		**Signature:**		**Date:**	

Revised: 23 September 2010

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APPENDIX 4

NOAA DIVING PROGRAM
DIVING EMERGENCY ASSISTANCE PLAN

NOAA Diving Unit and Dive Location:

Instructions

To be completed and submitted to NDP.Diveplans@noaa.gov with initial dive plan of each calendar year and every time any information in the Diving Emergency Assistance Plan changes.

General Procedures

A Evaluate victim's Airway, Breathing, and Circulation (ABCs).

B If not breathing, begin basic life support to include CPR if necessary. Use a Manually Triggered Ventilator (MTV) or bag-type oxygen resuscitator.

C If breathing, place diver in supine position and administer 100% oxygen using a MTV/ demand oxygen resucitator or nonrebreather type mask.

D If condition is life-threatening, call local Emergency Medical System (EMS) or USCG for transport to nearest medical treatment facility. If condition is not life-threatening, contact NOAA DMO for guidance. If unable to reach NOAA DMO within 15 min, contact Divers Alert Network.

E Keep victim comfortable and observe for shock or change in condition. If not nauseated and not experiencing altered level of consciousness, give victim water to drink.

F Gather additional information about the incident and prepare for transport.

G Call NOAA DMO (if not already done) to report incident.

Contacts

Primary Operational Recompression Chamber

Name:

Address:

Point of Contact:

Telephone Number:

Secondary Operational Recompression Chamber

Name:

Address:

Point of Contact:

Telephone Number:

Revised: 9 February 2011

Primary Hospital Emergency Room

Name:

Address:

Point of Contact:

Telephone Number:

Secondary Hospital Emergency Room

Name:

Address:

Point of Contact:

Telephone Number:

Shore-Based Emergency Transportation

Name:

Point of Contact:

Telephone Number:

At-Sea Emergency Transportation

Name:

Point of Contact:

Telephone Number:

Nearest U.S. Coast Guard Rescue Coordination Center:

- Great Lakes, East Coast and Gulf of Mexico:
  Atlantic Area Search and Rescue (SAR) Coordinator: (757) 398-6700
- Hawaii, Alaska, Pacific Coast:
  Pacific Area Search and Rescue (SAR) Coordinator: (510) 437-3700

NOAA DMO

- LCDR Joel Dulaigh office (206) 526-6474 cell (206) 300-2098

Divers Alert Network

- (919) 684-9111 or (800) 446-2671

Revised: 9 February 2011

APPENDIX 5

NOAA DIVING PROGRAM
PRE AND POST DIVE CHECKLIST

PRE-DIVE

1. Mission Safety

- ☐ Dive objectives and goals are defined, reviewed and understood by the dive and support personnel.
- ☐ The Diving Accident Management Plan is posted, coordinated and reviewed (i.e., chamber availability, evacuation route, etc.), and all personnel are informed of their duties.
- ☐ Conduct a pre-dive briefing.

2. Evaluate and Prepare for Potential Hazards

- ☐ Identify dive site entry procedures and exit access point(s).
- ☐ Define depth, bottom time and cylinder ending pressure limits for the planned dive.
- ☐ Evaluate and discuss potential for entrapment, entanglement, other physical or mechanical hazards, bottom obstructions, dangerous bottom conditions or marine life, and marine traffic hazards.
- ☐ Complete Dive Safe Ship Operations (NOAA Form 64-3), if applicable.

3. Diving and Support Personnel

- ☐ Ensure that all divers are authorized to perform their assigned duties according to their NOAA certification levels (i.e., Working Diver, Scientific Diver, Trainee Diver, or Observational Diver).
- ☐ Ensure that all divers are qualified to complete assigned underwater tasks safely.
- ☐ Ensure support personnel understand all diver hand signals, emergency recall signals and can offer immediate assistance in case of an emergency.
- ☐ Provide an assessment of repetitive dive designations of a previous dive was made within 12 hours.

4. Equipment

- ☐ All support equipment (boats, compressor, oxygen kit, tools, etc.) are operated by trained personnel.
- ☐ All dive techniques to be used are safe and appropriate and authorized.
- ☐ All tools used are appropriate for the task.
- ☐ Complete diving first aid kit, first aid handbook, oxygen resuscitator, divemaster kit, a complete set of no-decompression air and Nitrox Tables, and dive flags are on site.

POST-DIVE

- ☐ Dive team buddies have remained together for a minimum of 30 minutes after each dive and have monitored each other's condition during that time.
- ☐ Notify watch on the vessel's bridge when operations are completed (if applicable).
- ☐ Ensure that all personal dive and support equipment is thoroughly cleaned and properly stowed.
- ☐ Conduct a dive debrief and critique operations, including procedures for flying after diving (if applicable).

Printed name of person completing checklist: _____

Signature of above person: _____

Date checklist completed: _____

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APPENDIX 6

RESCUE and DIVING SKILLS CHECKOUT REPORT

Name of Diver being evaluated: _____ Date: _____

Certification level: ☐ OBSERVER ☐ SCIENTIFIC ☐ WORKING ☐ ADVANCED WORKING ☐ MASTER

Name / location of Dive Unit: _____ Name of UDS: _____

Name of Diver conducting evaluation: _____ Signature: _____

PRELIMINARY OBSERVATIONS

Current training & medical:

- ☐ Dive Physical
- ☐ CPR / AED
- ☐ First Aid
- ☐ Oxygen Administration

Gear present and in good working condition:

- ☐ Regulator
- ☐ Alt. 2nd Stage
- ☐ Pressure Gauge
- ☐ Depth Gauge
- ☐ Bottom Timer
- ☐ Dive Computer
- ☐ BCD
- ☐ Wet/Dry Suit
- ☐ Weight Belt/Harness
- ☐ Cylinder
- ☐ Mask
- ☐ RASS
- ☐ Snorkel
- ☐ Fins
- ☐ Knife

DIVER SKILL EVALUATION

(Note as U = Unsatisfactory, N = Needs Improvement, S = Satisfactory, E = Excellent)

Physical fitness	_____	Ditch and don BCD	_____
Swimming ability	_____	Weight belt removal / replacement	_____
Properly weighted	_____	Disconnect / reconnect inflators (BCD/Dry Suit)	_____
Buoyancy control	_____	V.V.D.S. roll outs & venting	_____
Controlled descent / ascent rate	_____	Pre-dive buddy check	_____
U/W communication (hand signals)	_____	Buddy contact and awareness during dive	_____
U/W navigation & orientation	_____	Buddy breathing	_____
Mask removal, replace & clear	_____	Deploy and use RASS for controlled ascent	_____
Regulator recovery	_____	Recover unconscious diver from water	_____

POST DIVE ASSESSMENT

Critique of ability and skills

Remarks or problems encountered

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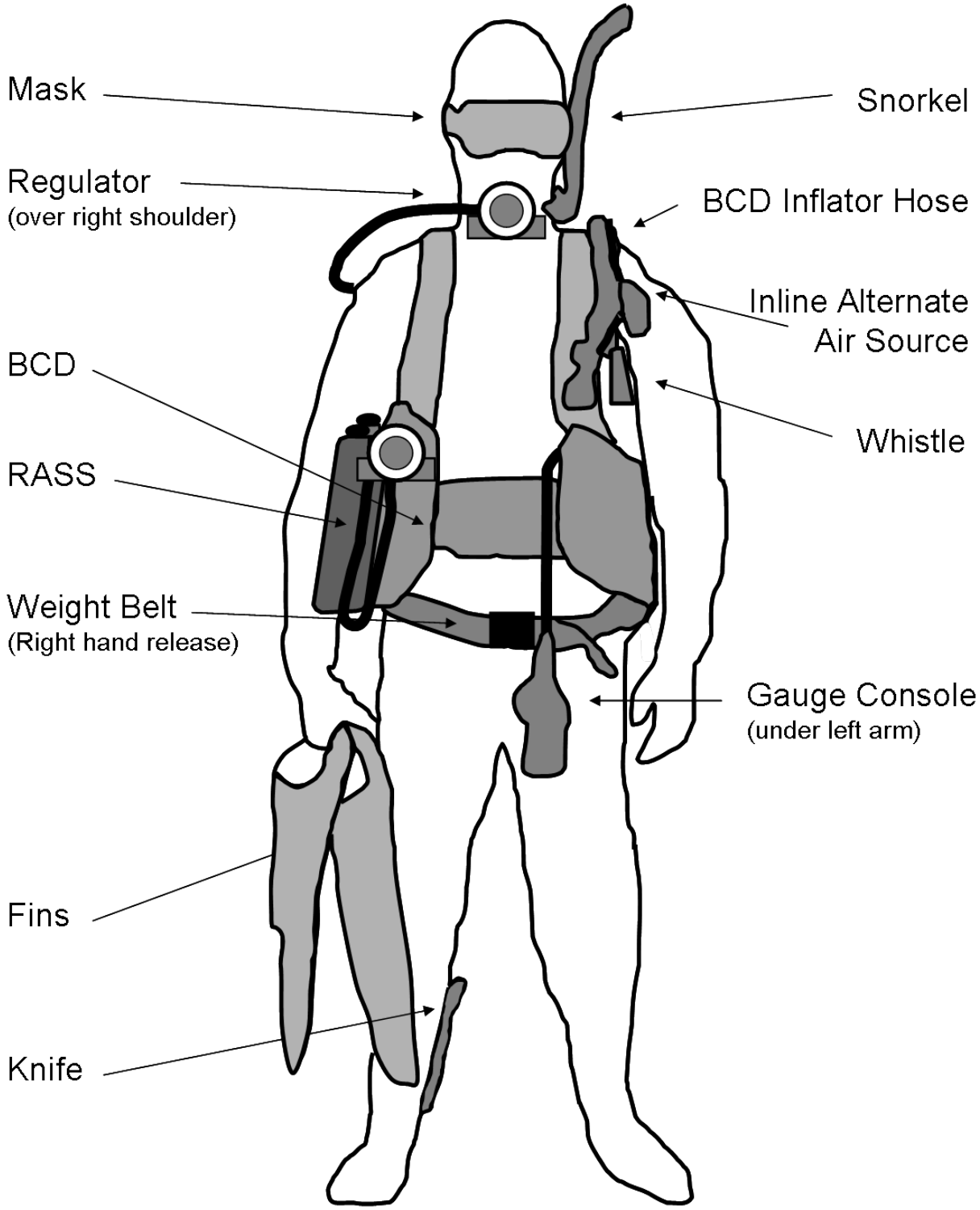
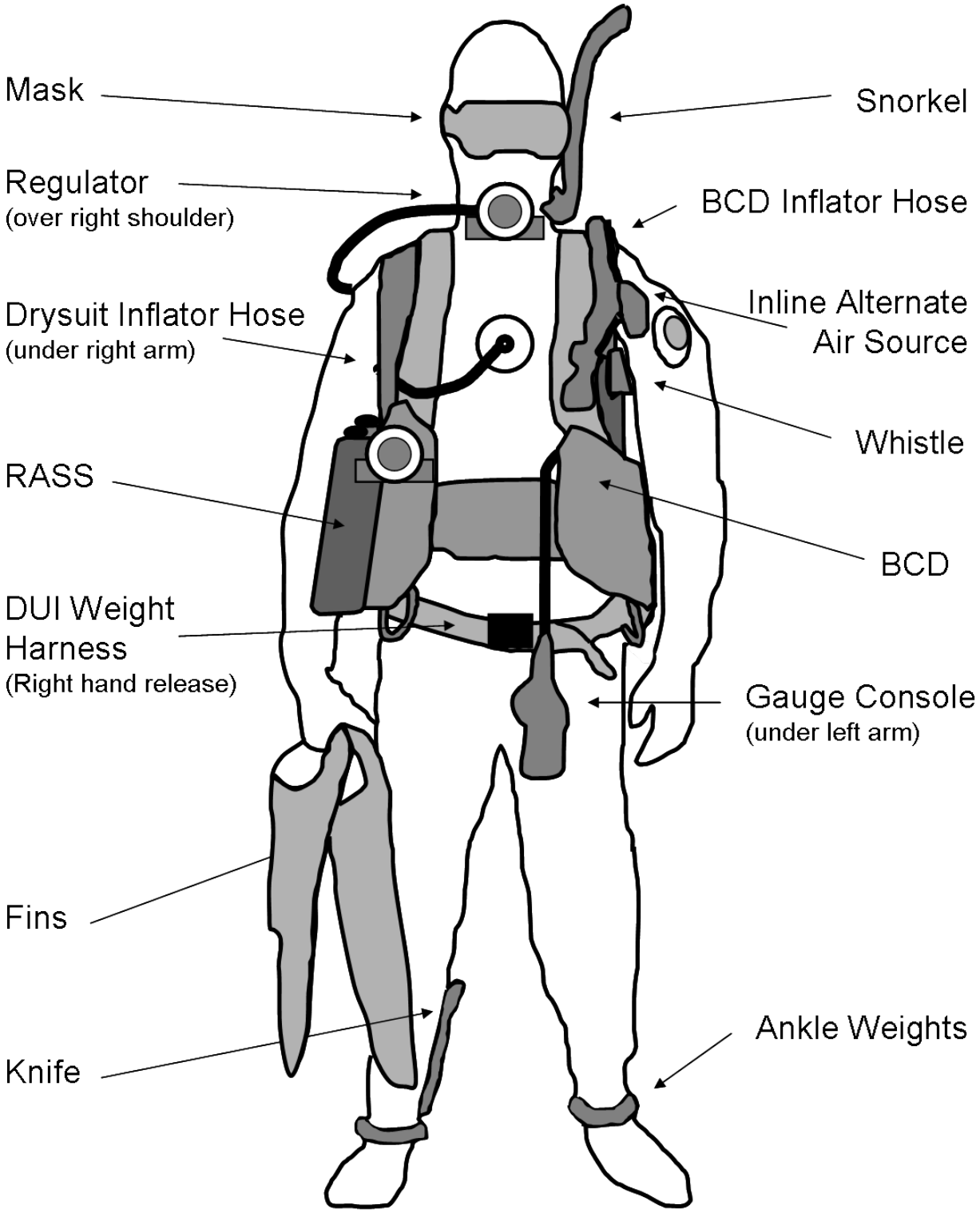
WETSUIT CONFIGURATION w/RASS



DRYSUIT CONFIGURATION w/RASS



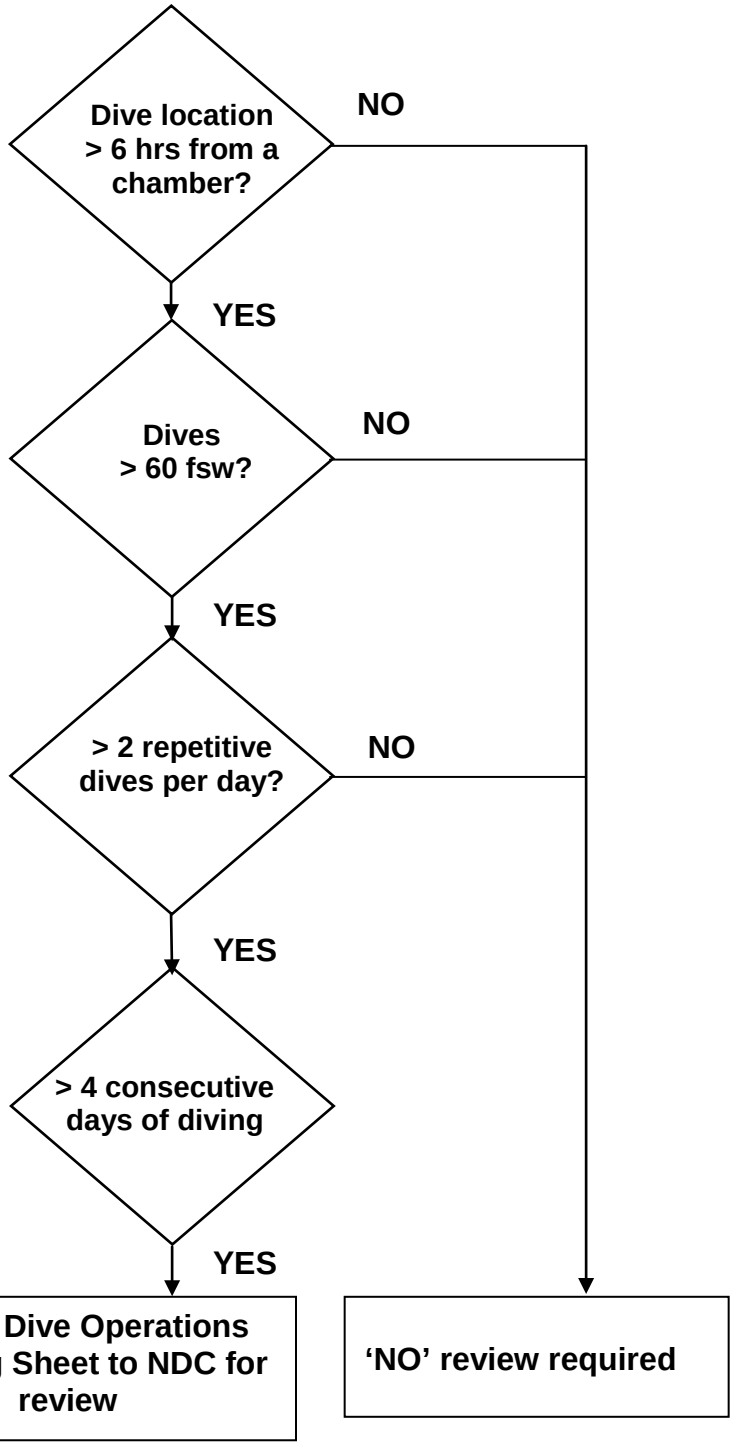
APPENDIX 8

NDP DIVE PLAN REVIEW POLICY ALGORITHM

Instructions: The algorithm to the right is intended to address the potential dangers of moderately deep, multi-day, multi-dive operations from a safety perspective. It is intended to help ensure that appropriate safeguards are in place to protect NOAA personnel engaged in remote diving operations.

An answer of 'yes' to each of the four decision boxes will necessitate submission of the NOAA Diving Center – Dive Operations Planning Sheet to the appropriate LODO/SODO for review. The LODO/SODO will review the information and determine if any special safety precautions are needed, including an on-site hyperbaric chamber.

Any 'no' answers will negate the need for review of the dive plan.



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APPENDIX 9

NOAA DIVERS FIRST AID KIT INVENTORY – SMALL KIT

General Items
DAN First Aid pocket book
Laminated Diver Injury report form w/ grease pencil
DMT Neuro exam slate
Inventory checklist slate
Pencil
Latex free gloves (12 pair)
Pocket mask
Tongue depressors
Oral airway

Dressing pack
Band aids – 1x3" (20)
Bacitracin or double antibiotic ointment (6)
Gauze 2X2s (5)
Gauze 4X4 dressings (5)
Non-stick (Telfa) dressings (3)
Gauze 2" roller bandage (2)
Gauze 4" roller bandage (2)
8X10 Abd dressing (2)
1" tape (2 rolls)
Silicon tape (1)
Cotton tip applicators – sterile (2)
Alcohol prep pads (12)
Chlorhexidine packets (10)
E-Z Scrub brush with chloroxylenol (1)
20cc syringe for irrigation

Drug Pack
Ibuprofen Tablets, 200mg (10)
Acetaminophen 500mg (10)
Diphenhydramine 25 mg (10)
Antacids
Loperamide (10)
Burn Jel packets (6)

Orthopedic Pack
Sam Splint (1)
Cold Compress (1)
Triangular bandages (2)
2" cloth tape (1 rolls)
3" Ace wrap (2)

Diagnostics/tools
Scissors (EMT shears)
Ring cutter
Tweezers
Small water resistant flashlight
Pint size bottle vinegar

NOAA DIVERS FIRST AID KIT INVENTORY – LARGE KIT

General Items
DAN First Aid pocket book
Laminated Diver Injury report form w/ grease pencil
DMT Neuro exam slate
Inventory checklist slate
Pen/pencil
Non latex gloves (12 pair)
Face shield with mask
Pocket mask
Tongue depressors (3)
Oral airways (1 each adult sizes)

Dressing pack
Band aids – 1x3" strip type (20)
Band aids – knuckle (5)
Bacitracin or double antibiotic ointment (10)
Adaptic non-adhering dressing (3)
Opsite transparent dressing (3)
Gauze 2X2s (10)
Gauze 4X4 dressings (5)
Non-stick (Telfa) dressings (5)
Kerlix 4" roll (2)
Gauze 2" roller bandage (4)
Gauze 4" roller bandage (4)
8X10 Abd dressing (2)
10X30 Trauma dressing (1)
Clot activator impregnated dressings (4)
1" tape (3 rolls)
Silicon tape
Steri strips (0.25" x 1.5")
Benzoin ampules (10)
Cotton tip applicators – sterile (5)
Alcohol prep pads (20)
Chlorhexidine packets (10)
E-Z Scrub brush with chloroxylenol (2)
20cc syringe for irrigation

Orthopedic Pack
Sam Splint (1)
Short board splint (1)
Cold Compress (2)
Triangular bandages (4)
2" cloth tape (1 roll)
3" Ace wrap (4)

Drug Pack
Ibuprofen Tablets, 200mg (20)
Acetaminophen 500mg (20)
Diphenhydramine 25 mg (20)
Antacids
Loperamide (20)
Hydrocortisone Cream, 1%, 1.5g
Burn Jel packets (6)

Diagnostics/tools
Blood pressure cuff
Stethoscope
Small water resistant flashlight
Thermometer
Scissors (EMT shears)
Reflex hammer
Ring cutter
Tweezers
Pocket Otoscope
Quart size bottle vinegar
Disposable razor (3)

APPENDIX 10

CODE OF FEDERAL REGULATIONS
29 CFR 1910: SUBPART T—COMMERCIAL DIVING OPERATIONS

Sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, and 657);

Section 107, Contract Work Hours and Safety Standards Act (the Construction Safety Act) (40 U.S.C. 333);

Section 41, Longshore and Harbor Workers' Compensation Act (33 U.S.C. 941); Secretary of Labor's Order No. 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), 6–96 (62 FR 111), 3–2000 (65 FR 50017), or 5–2002 (67 FR 65008), as applicable;

29 CFR part 1911.

Source: 42 FR 37668, July 22, 1977, unless otherwise noted.

General

§ 1910.401 Scope and application.

(a) Scope

(1) This subpart (standard) applies to every place of employment within the waters of the United States, or within any State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, Guam, the Trust Territory of the Pacific Islands, Wake Island, Johnston Island, the Canal Zone, or within the Outer Continental Shelf lands as defined in the Outer Continental Shelf Lands Act (67 Stat. 462, 43 U.S.C. 1331), where diving and related support operations are performed.

(2) This standard applies to diving and related support operations conducted in connection with all types of work and employments, including general industry, construction, ship repairing, shipbuilding, shipbreaking and longshoring. However, this standard does not apply to any diving operation:

(i) Performed solely for instructional purposes, using open-circuit, compressed-air SCUBA and conducted within the no-decompression limits;

(ii) Performed solely for search, rescue, or related public safety purposes by or under the control of a governmental agency; or

(iii) Governed by 45 CFR part 46 (Protection of Human Subjects, U.S. Department of Health and Human Services) or equivalent rules or regulations established by another federal agency, which regulate research, development, or related purposes involving human subjects.

(iv) Defined as scientific diving and which is under the direction and control of a diving program containing at least the following elements:

(A) Diving safety manual which includes at a minimum: Procedures covering all diving operations specific to the program; procedures for emergency care, including recompression and evacuation; and criteria for diver training and certification.

(B) Diving control (safety) board, with the majority of its members being active divers, which shall at a minimum have the authority to: Approve and monitor diving projects; review and revise the diving safety manual; assure compliance with the manual;

certify the depths to which a diver has been trained; take disciplinary action for unsafe practices; and, assure adherence to the buddy system (a diver is accompanied by and is in continuous contact with another diver in the water) for SCUBA diving.

(3) Alternative requirements for recreational diving instructors and diving guides. Employers of recreational diving instructors and diving guides are not required to comply with the decompression-chamber requirements specified by paragraphs (b)(2) and (c)(3)(iii) of §1910.423 and paragraph (b)(1) of §1910.426 when they meet all of the following conditions:

(i) The instructor or guide is engaging solely in recreational diving instruction or dive-guiding operations;

(ii) The instructor or guide is diving within the no-decompression limits in these operations;

(iii) The instructor or guide is using a Nitrox breathing-gas mixture consisting of a high percentage of oxygen (more than 22% by volume) mixed with nitrogen;

(iv) The instructor or guide is using an open-circuit, semi-closed-circuit, or closed-circuit self-contained underwater breathing apparatus (SCUBA); and

(v) The employer of the instructor or guide is complying with all requirements of Appendix C of this subpart.

(b) Application in emergencies. An employer may deviate from the requirements of this standard to the extent necessary to prevent or minimize a situation which is likely to cause death, serious physical harm, or major environmental damage, provided that the employer:

(1) Notifies the Area Director, Occupational Safety and Health Administration within 48 hours of the onset of the emergency situation indicating the nature of the emergency and extent of the deviation from the prescribed regulations; and

(2) Upon request from the Area Director, submits such information in writing.

(c) Employer obligation. The employer shall be responsible for compliance with:

(1) All provisions of this standard of general applicability; and

(2) All requirements pertaining to specific diving modes to the extent diving operations in such modes are conducted.

[42 FR 37668, July 22, 1977, as amended at 47 FR 53365, Nov. 26, 1982; 58 FR 35310, June 30, 1993; 69 FR 7363, Feb. 17, 2004]

§ 1910.402 Definitions.

As used in this standard, the listed terms are defined as follows:

Acfm: Actual cubic feet per minute.

ASME Code or equivalent: ASME (American Society of Mechanical Engineers) Boiler and Pressure Vessel Code, Section VIII, or an equivalent code which the employer can demonstrate to be equally effective.

ATA: Atmosphere absolute.

Bell: An enclosed compartment, pressurized (closed bell) or unpressurized (open bell), which allows the diver to be transported to and from the underwater work area and which may be used as a temporary refuge during diving operations.

Bottom time: The total elapsed time measured in minutes from the time when the diver leaves the surface in descent to the time that the diver begins ascent.

Bursting pressure: The pressure at which a pressure containment device would fail structurally.

Cylinder: A pressure vessel for the storage of gases.

Decompression chamber: A pressure vessel for human occupancy such as a surface hyperbaric chamber, closed bell, or deep diving system used to decompress divers and to treat decompression sickness.

Decompression sickness: A condition with a variety of symptoms which may result from gas or bubbles in the tissues of divers after pressure reduction.

Decompression table: A profile or set of profiles of depth-time relationships for ascent rates and breathing mixtures to be followed after a specific depth-time exposure or exposures.

Dive-guiding operations means leading groups of sports divers, who use an open-circuit, semi-closed-circuit, or closed-circuit self-contained underwater breathing apparatus, to local undersea diving locations for recreational purposes.

Dive location: A surface or vessel from which a diving operation is conducted.

Dive-location reserve breathing gas: A supply system of air or mixed-gas (as appropriate) at the dive location which is independent of the primary supply system and sufficient to support divers during the planned decompression.

Dive team: Divers and support employees involved in a diving operation, including the designated person-in-charge.

Diver: An employee working in water using underwater apparatus which supplies compressed breathing gas at the ambient pressure.

Diver-carried reserve breathing gas: A diver-carried supply of air or mixed gas (as appropriate) sufficient under standard operating conditions to allow the diver to reach the surface, or another source of breathing gas, or to be reached by a standby diver.

Diving mode: A type of diving requiring specific equipment, procedures and techniques (SCUBA, surface-supplied air, or mixed gas).

Fsw: Feet of seawater (or equivalent static pressure head).

Heavy gear: Diver-worn deep-sea dress including helmet, breastplate, dry suit, and weighted shoes.

Hyperbaric conditions: Pressure conditions in excess of surface pressure.

Inwater stage: A suspended underwater platform which supports a diver in the water.

Liveboating: The practice of supporting a surfaced-supplied air or mixed gas diver from a vessel which is underway.

Mixed-gas diving: A diving mode in which the diver is supplied in the water with a breathing gas other than air.

No-decompression limits: The depth-time limits of the “no-decompression limits and repetitive dive group designation table for no-decompression air dives”, U.S. Navy Diving Manual or equivalent limits which the employer can demonstrate to be equally effective.

Psi(g): Pounds per square inch (gauge).

Recreational diving instruction means training diving students in the use of recreational diving procedures and the safe operation of diving equipment, including an open-circuit, semi-closed-circuit, or closed-circuit self-contained underwater breathing apparatus, during dives.

Scientific diving means diving performed solely as a necessary part of a scientific, research, or educational activity by employees whose sole purpose for diving is to perform scientific research tasks. Scientific diving does not include performing any tasks usually associated with commercial diving such as: Placing or removing heavy objects underwater; inspection of pipelines and similar objects; construction; demolition; cutting or welding; or the use of explosives.

SCUBA diving: A diving mode independent of surface supply in which the diver uses open circuit self-contained underwater breathing apparatus.

Standby diver: A diver at the dive location available to assist a diver in the water.

Surface-supplied air diving: A diving mode in which the diver in the water is supplied from the dive location with compressed air for breathing.

Treatment table: A depth-time and breathing gas profile designed to treat decompression sickness.

Umbilical: The composite hose bundle between a dive location and a diver or bell, or between a diver and a bell, which supplies the diver or bell with breathing gas, communications, power, or heat as appropriate to the diving mode or conditions, and includes a safety line between the diver and the dive location.

Volume tank: A pressure vessel connected to the outlet of a compressor and used as an air reservoir.

Working pressure: The maximum pressure to which a pressure containment device may be exposed under standard operating conditions.

Personnel Requirements

§ 1910.410 Qualifications of dive team.

(a) General.

(1) Each dive team member shall have the experience or training necessary to perform assigned tasks in a safe and healthful manner.

(2) Each dive team member shall have experience or training in the following:

(i) The use of tools, equipment and systems relevant to assigned tasks;

(ii) Techniques of the assigned diving mode: and

(iii) Diving operations and emergency procedures.

(3) All dive team members shall be trained in cardiopulmonary resuscitation and first aid (American Red Cross standard course or equivalent).

(4) Dive team members who are exposed to or control the exposure of others to hyperbaric conditions shall be trained in diving-related physics and physiology.

(b) Assignments.

(1) Each dive team member shall be assigned tasks in accordance with the employee's experience or training, except that limited additional tasks may be assigned to an employee

undergoing training provided that these tasks are performed under the direct supervision of an experienced dive team member.

(2) The employer shall not require a dive team member to be exposed to hyperbaric conditions against the employee's will, except when necessary to complete decompression or treatment procedures.

(3) The employer shall not permit a dive team member to dive or be otherwise exposed to hyperbaric conditions for the duration of any temporary physical impairment or condition which is known to the employer and is likely to affect adversely the safety or health of a dive team member.

(c) Designated person-in-charge.

(1) The employer or an employee designated by the employer shall be at the dive location in charge of all aspects of the diving operation affecting the safety and health of dive team members.

(2) The designated person-in-charge shall have experience and training in the conduct of the assigned diving operation.

General Operations Procedures

§ 1910.420 Safe practices manual.

(a) General. The employer shall develop and maintain a safe practices manual which shall be made available at the dive location to each dive team member.

(b) Contents.

(1) The safe practices manual shall contain a copy of this standard and the employer's policies for implementing the requirements of this standard.

(2) For each diving mode engaged in, the safe practices manual shall include:

(i) Safety procedures and checklists for diving operations;

(ii) Assignments and responsibilities of the dive team members;

(iii) Equipment procedures and checklists; and

(iv) Emergency procedures for fire, equipment failure, adverse environmental conditions, and medical illness and injury.

§ 1910.421 Pre-dive procedures.

(a) General. The employer shall comply with the following requirements prior to each diving operation, unless otherwise specified.

(b) Emergency aid. A list shall be kept at the dive location of the telephone or call numbers of the following:

(1) An operational decompression chamber (if not at the dive location);

(2) Accessible hospitals;

(3) Available physicians;

(4) Available means of transportation; and

(5) The nearest U.S. Coast Guard Rescue Coordination Center.

(c) First aid supplies.

(1) A first aid kit appropriate for the diving operation and approved by a physician shall be available at the dive location.

(2) When used in a decompression chamber or bell, the first aid kit shall be suitable for use under hyperbaric conditions.

(3) In addition to any other first aid supplies, an American Red Cross standard first aid handbook or equivalent, and a bag-type manual resuscitator with transparent mask and tubing shall be available at the dive location.

(d) Planning and assessment. Planning of a diving operation shall include an assessment of the safety and health aspects of the following:

(1) Diving mode;

(2) Surface and underwater conditions and hazards;

(3) Breathing gas supply (including reserves);

(4) Thermal protection;

(5) Diving equipment and systems;

(6) Dive team assignments and physical fitness of dive team members (including any impairment known to the employer);

(7) Repetitive dive designation or residual inert gas status of dive team members;

(8) Decompression and treatment procedures (including altitude corrections); and

(9) Emergency procedures.

(e) Hazardous activities. To minimize hazards to the dive team, diving operations shall be coordinated with other activities in the vicinity which are likely to interfere with the diving operation.

(f) Employee briefing.

(1) Dive team members shall be briefed on:

(i) The tasks to be undertaken;

(ii) Safety procedures for the diving mode;

(iii) Any unusual hazards or environmental conditions likely to affect the safety of the diving operation; and

(iv) Any modifications to operating procedures necessitated by the specific diving operation.

(2) Prior to making individual dive team member assignments, the employer shall inquire into the dive team member's current state of physical fitness, and indicate to the dive team member the procedure for reporting physical problems or adverse physiological effects during and after the dive.

(g) Equipment inspection. The breathing gas supply system including reserve breathing gas supplies, masks, helmets, thermal protection, and bell handling mechanism (when appropriate) shall be inspected prior to each dive.

(h) Warning signal. When diving from surfaces other than vessels in areas capable of supporting marine traffic, a rigid replica of the international code flag “A” at least one meter in height shall be

displayed at the dive location in a manner which allows all-round visibility, and shall be illuminated during night diving operations.

§ 1910.422 Procedures during dive.

(a) General. The employer shall comply with the following requirements which are applicable to each diving operation unless otherwise specified.

(b) Water entry and exit.

(1) A means capable of supporting the diver shall be provided for entering and exiting the water.

(2) The means provided for exiting the water shall extend below the water surface.

(3) A means shall be provided to assist an injured diver from the water or into a bell.

(c) Communications.

(1) An operational two-way voice communication system shall be used between:

(i) Each surface-supplied air or mixed-gas diver and a dive team member at the dive location or bell (when provided or required); and

(ii) The bell and the dive location.

(2) An operational, two-way communication system shall be available at the dive location to obtain emergency assistance.

(d) Decompression tables. Decompression, repetitive, and no-decompression tables (as appropriate) shall be at the dive location.

(e) Dive profiles. A depth-time profile, including when appropriate any breathing gas changes, shall be maintained for each diver during the dive including decompression.

(f) Hand-held power tools and equipment.

(1) Hand-held electrical tools and equipment shall be de-energized before being placed into or retrieved from the water.

(2) Hand-held power tools shall not be supplied with power from the dive location until requested by the diver.

(g) Welding and burning.

(1) A current supply switch to interrupt the current flow to the welding or burning electrode shall be:

(i) Tended by a dive team member in voice communication with the diver performing the welding or burning; and

(ii) Kept in the open position except when the diver is welding or burning.

(2) The welding machine frame shall be grounded.

(3) Welding and burning cables, electrode holders, and connections shall be capable of carrying the maximum current required by the work, and shall be properly insulated.

(4) Insulated gloves shall be provided to divers performing welding and burning operations.

(5) Prior to welding or burning on closed compartments, structures or pipes, which contain a flammable vapor or in which a flammable vapor may be generated by the work, they shall be vented, flooded, or purged with a mixture of gases which will not support combustion.

(h) Explosives.

(1) Employers shall transport, store, and use explosives in accordance with this section and the applicable provisions of §1910.109 and §1926.912 of Title 29 of the Code of Federal Regulations.

(2) Electrical continuity of explosive circuits shall not be tested until the diver is out of the water.

(3) Explosives shall not be detonated while the diver is in the water.

(i) Termination of dive. The working interval of a dive shall be terminated when:

(1) A diver requests termination;

(2) A diver fails to respond correctly to communications or signals from a dive team member;

(3) Communications are lost and cannot be quickly re-established between the diver and a dive team member at the dive location, and between the designated person-in-charge and the person controlling the vessel in liveboating operations; or

(4) A diver begins to use diver-carried reserve breathing gas or the dive-location reserve breathing gas.

§ 1910.423 Post-dive procedures.

(a) General. The employer shall comply with the following requirements which are applicable after each diving operation, unless otherwise specified.

(b) Precautions.

(1) After the completion of any dive, the employer shall:

(i) Check the physical condition of the diver;

(ii) Instruct the diver to report any physical problems or adverse physiological effects including symptoms of decompression sickness;

(iii) Advise the diver of the location of a decompression chamber which is ready for use; and

(iv) Alert the diver to the potential hazards of flying after diving.

(2) For any dive outside the no-decompression limits, deeper than 100 fsw or using mixed gas as a breathing mixture, the employer shall instruct the diver to remain awake and in the vicinity of the decompression chamber which is at the dive location for at least one hour after the dive (including decompression or treatment as appropriate).

(c) Recompression capability.

(1) A decompression chamber capable of recompressing the diver at the surface to a minimum of 165 fsw (6 ATA) shall be available at the dive location for:

(i) Surface-supplied air diving to depths deeper than 100 fsw and shallower than 220 fsw;

(ii) Mixed gas diving shallower than 300 fsw; or

(iii) Diving outside the no-decompression limits shallower than 300 fsw.

(2) A decompression chamber capable of recompressing the diver at the surface to the maximum depth of the dive shall be available at the dive location for dives deeper than 300 fsw.

(3) The decompression chamber shall be:

(i) Dual-lock;

(ii) Multiplace; and

(iii) Located within 5 minutes of the dive location.

(4) The decompression chamber shall be equipped with:

(i) A pressure gauge for each pressurized compartment designed for human occupancy;

(ii) A built-in-breathing-system with a minimum of one mask per occupant;

(iii) A two-way voice communication system between occupants and a dive team member at the dive location;

(iv) A viewport; and

(v) Illumination capability to light the interior.

(5) Treatment tables, treatment gas appropriate to the diving mode, and sufficient gas to conduct treatment shall be available at the dive location.

(6) A dive team member shall be available at the dive location during and for at least one hour after the dive to operate the decompression chamber (when required or provided).

(d) Record of dive.

(1) The following information shall be recorded and maintained for each diving operation:

(i) Names of dive team members including designated person-in-charge;

(ii) Date, time, and location;

(iii) Diving modes used;

(iv) General nature of work performed;

(v) Approximate underwater and surface conditions (visibility, water temperature and current); and

(vi) Maximum depth and bottom time for each diver.

(2) For each dive outside the no-decompression limits, deeper than 100 fsw or using mixed gas, the following additional information shall be recorded and maintained:

(i) Depth-time and breathing gas profiles;

(ii) Decompression table designation (including modification); and

(iii) Elapsed time since last pressure exposure if less than 24 hours or repetitive dive designation for each diver.

(3) For each dive in which decompression sickness is suspected or symptoms are evident, the following additional information shall be recorded and maintained:

(i) Description of decompression sickness symptoms (including depth and time of onset); and

(ii) Description and results of treatment.

(e) Decompression procedure assessment. The employer shall:

(1) Investigate and evaluate each incident of decompression sickness based on the recorded information, consideration of the past performance of decompression table used, and individual susceptibility;

(2) Take appropriate corrective action to reduce the probability of recurrence of decompression sickness; and

(3) Prepare a written evaluation of the decompression procedure assessment, including any corrective action taken, within 45 days of the incident of decompression sickness.

Specific Operations Procedures

§ 1910.424 SCUBA diving.

(a) General. Employers engaged in SCUBA diving shall comply with the following requirements, unless otherwise specified.

(b) Limits. SCUBA diving shall not be conducted:

(1) At depths deeper than 130 fsw;

(2) At depths deeper than 100 fsw or outside the no-decompression limits unless a decompression chamber is ready for use;

(3) Against currents exceeding one (1) knot unless line-tended; or

(4) In enclosed or physically confining spaces unless line-tended.

(c) Procedures.

(1) A standby diver shall be available while a diver is in the water.

(2) A diver shall be line-tended from the surface, or accompanied by another diver in the water in continuous visual contact during the diving operations.

(3) A diver shall be stationed at the underwater point of entry when diving is conducted in enclosed or physically confining spaces.

(4) A diver-carried reserve breathing gas supply shall be provided for each diver consisting of:

(i) A manual reserve (J valve); or

(ii) An independent reserve cylinder with a separate regulator or connected to the underwater breathing apparatus.

(5) The valve of the reserve breathing gas supply shall be in the closed position prior to the dive.

§ 1910.425 Surface-supplied air diving.

(a) General. Employers engaged in surface-supplied air diving shall comply with the following requirements, unless otherwise specified.

(b) Limits.

(1) Surface-supplied air diving shall not be conducted at depths deeper than 190 fsw, except that dives with bottom times of 30 minutes or less may be conducted to depths of 220 fsw.

(2) A decompression chamber shall be ready for use at the dive location for any dive outside the no-decompression limits or deeper than 100 fsw.

(3) A bell shall be used for dives with an inwater decompression time greater than 120 minutes, except when heavy gear is worn or diving is conducted in physically confining spaces.

(c) Procedures.

(1) Each diver shall be continuously tended while in the water.

(2) A diver shall be stationed at the underwater point of entry when diving is conducted in enclosed or physically confining spaces.

(3) Each diving operation shall have a primary breathing gas supply sufficient to support divers for the duration of the planned dive including decompression.

(4) For dives deeper than 100 fsw or outside the no-decompression limits:

(i) A separate dive team member shall tend each diver in the water;

(ii) A standby diver shall be available while a diver is in the water;

(iii) A diver-carried reserve breathing gas supply shall be provided for each diver except when heavy gear is worn; and

(iv) A dive-location reserve breathing gas supply shall be provided.

(5) For heavy-gear diving deeper than 100 fsw or outside the no-decompression limits:

(i) An extra breathing gas hose capable of supplying breathing gas to the diver in the water shall be available to the standby diver.

(ii) An inwater stage shall be provided to divers in the water.

(6) Except when heavy gear is worn or where physical space does not permit, a diver-carried reserve breathing gas supply shall be provided whenever the diver is prevented by the configuration of the dive area from ascending directly to the surface.

§ 1910.426 Mixed-gas diving.

(a) General. Employers engaged in mixed-gas diving shall comply with the following requirements, unless otherwise specified.

(b) Limits. Mixed-gas diving shall be conducted only when:

(1) A decompression chamber is ready for use at the dive location; and

(i) A bell is used at depths greater than 220 fsw or when the dive involves inwater decompression time of greater than 120 minutes, except when heavy gear is worn or when diving in physically confining spaces; or

(ii) A closed bell is used at depths greater than 300 fsw, except when diving is conducted in physically confining spaces.

(c) Procedures.

(1) A separate dive team member shall tend each diver in the water.

(2) A standby diver shall be available while a diver is in the water.

(3) A diver shall be stationed at the underwater point of entry when diving is conducted in enclosed or physically confining spaces.

(4) Each diving operation shall have a primary breathing gas supply sufficient to support divers for the duration of the planned dive including decompression.

(5) Each diving operation shall have a dive-location reserve breathing gas supply.

(6) When heavy gear is worn:

(i) An extra breathing gas hose capable of supplying breathing gas to the diver in the water shall be available to the standby diver; and

(ii) An inwater stage shall be provided to divers in the water.

(7) An inwater stage shall be provided for divers without access to a bell for dives deeper than 100 fsw or outside the no-decompression limits.

(8) When a closed bell is used, one dive team member in the bell shall be available and tend the diver in the water.

(9) Except when heavy gear is worn or where physical space does not permit, a diver-carried reserve breathing gas supply shall be provided for each diver:

(i) Diving deeper than 100 fsw or outside the no-decompression limits; or

(ii) Prevented by the configuration of the dive area from directly ascending to the surface.

§ 1910.427 Liveboating.

(a) General. Employers engaged in diving operations involving liveboating shall comply with the following requirements.

(b) Limits. Diving operations involving liveboating shall not be conducted:

(1) With an inwater decompression time of greater than 120 minutes;

(2) Using surface-supplied air at depths deeper than 190 fsw, except that dives with bottom times of 30 minutes or less may be conducted to depths of 220 fsw;

(3) Using mixed gas at depths greater than 220 fsw;

(4) In rough seas which significantly impede diver mobility or work function; or

(5) In other than daylight hours.

(c) Procedures.

(1) The propeller of the vessel shall be stopped before the diver enters or exits the water.

(2) A device shall be used which minimizes the possibility of entanglement of the diver's hose in the propeller of the vessel.

(3) Two-way voice communication between the designated person-in-charge and the person controlling the vessel shall be available while the diver is in the water.

(4) A standby diver shall be available while a diver is in the water.

(5) A diver-carried reserve breathing gas supply shall be carried by each diver engaged in liveboating operations.

Equipment Procedures and Requirements

§ 1910.430 Equipment.

(a) General.

(1) All employers shall comply with the following requirements, unless otherwise specified.

(2) Each equipment modification, repair, test, calibration or maintenance service shall be recorded by means of a tagging or logging system, and include the date and nature of work performed, and the name or initials of the person performing the work.

(b) Air compressor system.

(1) Compressors used to supply air to the diver shall be equipped with a volume tank with a check valve on the inlet side, a pressure gauge, a relief valve, and a drain valve.

(2) Air compressor intakes shall be located away from areas containing exhaust or other contaminants.

(3) Respirable air supplied to a diver shall not contain:

(i) A level of carbon monoxide (CO) greater than 20 p/m;

(ii) A level of carbon dioxide (CO2) greater than 1,000 p/m;

(iii) A level of oil mist greater than 5 milligrams per cubic meter; or

(iv) A noxious or pronounced odor.

(4) The output of air compressor systems shall be tested for air purity every 6 months by means of samples taken at the connection to the distribution system, except that non-oil lubricated compressors need not be tested for oil mist.

(c) Breathing gas supply hoses.

(1) Breathing gas supply hoses shall:

(i) Have a working pressure at least equal to the working pressure of the total breathing gas system;

(ii) Have a rated bursting pressure at least equal to 4 times the working pressure;

(iii) Be tested at least annually to 1.5 times their working pressure; and

(iv) Have their open ends taped, capped or plugged when not in use.

(2) Breathing gas supply hose connectors shall:

(i) Be made of corrosion-resistant materials;

(ii) Have a working pressure at least equal to the working pressure of the hose to which they are attached; and

(iii) Be resistant to accidental disengagement.

(3) Umbilicals shall:

(i) Be marked in 10-ft. increments to 100 feet beginning at the diver's end, and in 50 ft. increments thereafter;

(ii) Be made of kink-resistant materials; and

(iii) Have a working pressure greater than the pressure equivalent to the maximum depth of the dive (relative to the supply source) plus 100 psi.

(d) Buoyancy control.

(1) Helmets or masks connected directly to the dry suit or other buoyancy-changing equipment shall be equipped with an exhaust valve.

(2) A dry suit or other buoyancy-changing equipment not directly connected to the helmet or mask shall be equipped with an exhaust valve.

(3) When used for SCUBA diving, a buoyancy compensator shall have an inflation source separate from the breathing gas supply.

(4) An inflatable flotation device capable of maintaining the diver at the surface in a face-up position, having a manually activated inflation source independent of the breathing supply, an oral inflation device, and an exhaust valve shall be used for SCUBA diving.

(e) Compressed gas cylinders. Compressed gas cylinders shall:

(1) Be designed, constructed and maintained in accordance with the applicable provisions of 29 CFR 1910.101 and 1910.169 through 1910.171.

(2) Be stored in a ventilated area and protected from excessive heat;

(3) Be secured from falling; and

(4) Have shut-off valves recessed into the cylinder or protected by a cap, except when in use or manifolded, or when used for SCUBA diving.

(f) Decompression chambers.

(1) Each decompression chamber manufactured after the effective date of this standard, shall be built and maintained in accordance with the ASME Code or equivalent.

(2) Each decompression chamber manufactured prior to the effective date of this standard shall be maintained in conformity with the code requirements to which it was built, or equivalent.

(3) Each decompression chamber shall be equipped with:

(i) Means to maintain the atmosphere below a level of 25 percent oxygen by volume;

(ii) Mufflers on intake and exhaust lines, which shall be regularly inspected and maintained;

(iii) Suction guards on exhaust line openings; and

(iv) A means for extinguishing fire, and shall be maintained to minimize sources of ignition and combustible material.

(g) Gauges and timekeeping devices.

(1) Gauges indicating diver depth which can be read at the dive location shall be used for all dives except SCUBA.

(2) Each depth gauge shall be deadweight tested or calibrated against a master reference gauge every 6 months, and when there is a discrepancy greater than two percent (2 percent) of full scale between any two equivalent gauges.

(3) A cylinder pressure gauge capable of being monitored by the diver during the dive shall be worn by each SCUBA diver.

(4) A timekeeping device shall be available at each dive location.

(h) Masks and helmets.

(1) Surface-supplied air and mixed-gas masks and helmets shall have:

(i) A non-return valve at the attachment point between helmet or mask and hose which shall close readily and positively; and

(ii) An exhaust valve.

(2) Surface-supplied air masks and helmets shall have a minimum ventilation rate capability of 4.5 acfm at any depth at which they are operated or the capability of maintaining the diver's inspired carbon dioxide partial pressure below 0.02 ATA when the diver is producing carbon dioxide at the rate of 1.6 standard liters per minute.

(i) Oxygen safety.

(1) Equipment used with oxygen or mixtures containing over forty percent (40%) by volume oxygen shall be designed for oxygen service.

(2) Components (except umbilicals) exposed to oxygen or mixtures containing over forty percent (40%) by volume oxygen shall be cleaned of flammable materials before use.

(3) Oxygen systems over 125 psig and compressed air systems over 500 psig shall have slow-opening shut-off valves.

(j) Weights and harnesses.

(1) Except when heavy gear is worn, divers shall be equipped with a weight belt or assembly capable of quick release.

(2) Except when heavy gear is worn or in SCUBA diving, each diver shall wear a safety harness with:

(i) A positive buckling device;

(ii) An attachment point for the umbilical to prevent strain on the mask or helmet; and

(iii) A lifting point to distribute the pull force of the line over the diver's body.

Recordkeeping

1910.440 Recordkeeping requirements.

(a)

(1) [Reserved]

(2) The employer shall record the occurrence of any diving-related injury or illness which requires any dive team member to be hospitalized for 24 hours or more, specifying the circumstances of the incident and the extent of any injuries or illnesses.

(b) Availability of records.

(1) Upon the request of the Assistant Secretary of Labor for Occupational Safety and Health, or the Director, National Institute for Occupational Safety and Health, Department of Health and Human Services of their designees, the employer shall make available for inspection and copying any record or document required by this standard.

(2) Records and documents required by this standard shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with 29 CFR 1910.20 (a)–(e) and (g)–(i). Safe practices manuals (§1910.420), depth-time profiles (§1910.422), recordings of dives (§1910.423), decompression procedure assessment evaluations (§1910.423), and records of hospitalizations (§1910.440) shall be provided in the same manner as employee exposure records or analyses using exposure or medical records. Equipment inspections and testing records which pertain to employees (§1910.430) shall also be provided upon request to employees and their designated representatives.

(3) Records and documents required by this standard shall be retained by the employer for the following period:

(i) Dive team member medical records (physician's reports) (§1910.411) – 5 years;

(ii) Safe practices manual (§1910.420) – current document only;

(iii) Depth-time profile (§1910.422) – until completion of the recording of dive, or until completion of decompression procedure assessment where there has been an incident of decompression sickness;

(iv) Recording of dive (§1910.423) – 1 year, except 5 years where there has been an incident of decompression sickness;

(v) Decompression procedure assessment evaluations (§1910.423) – 5 years;

(vi) Equipment inspections and testing records (§1910.430) – current entry or tag, or until equipment is withdrawn from service;

(vii) Records of hospitalizations (§1910.440) – 5 years.

(4) After the expiration of the retention period of any record required to be kept for five (5) years, the employer shall forward such records to the National Institute for Occupational Safety and Health, Department of Health and Human Services. The employer shall also comply with any additional requirements set forth at 29 CFR 1910.20(h).

(5) In the event the employer ceases to do business:

(i) The successor employer shall receive and retain all dive and employee medical records required by this standard; or

(ii) If there is no successor employer, dive and employee medical records shall be forwarded to the National Institute for Occupational Safety and Health, Department of Health and Human Services.

§ 1910.441 Effective date.

This standard shall be effective on October 20, 1977, except that for provisions where decompression chambers or bells are required and such equipment is not yet available, employers shall comply as soon as possible thereafter but in no case later than 6 months after the effective date of the standard.

Appendix A to 1910 Subpart T – Examples of conditions which may restrict or limit exposure to hyperbaric conditions

The following disorders may restrict or limit occupational exposure to hyperbaric conditions depending on severity, presence of residual effects, response to therapy, number of occurrences, diving mode, or degree and duration of isolation:

History of seizure disorder other than early febrile convulsions.

Malignancies (active) unless treated and without recurrence for 5 yrs.

Chronic inability to equalize sinus and/or middle ear pressure.

Cystic or cavitary disease of the lungs.

Impaired organ function caused by alcohol or drug use.

Conditions requiring continuous medication for control (e.g., antihistamines, steroids, barbiturates, mood altering drugs, or insulin).

Meniere's disease.

Hemoglobinopathies.

Obstructive or restrictive lung disease.

Vestibular end organ destruction.

Pneumothorax.

Cardiac abnormalities (e.g., pathological heart block, valvular disease, intraventricular conduction defects other than isolated right bundle branch block, angina pectoris, arrhythmia, coronary artery disease).

Juxta-articular osteonecrosis.

Appendix B to 1910 Subpart T – Guidelines for scientific diving

This appendix contains guidelines that will be used in conjunction with 1910.401(a)(2)(iv) to determine those scientific diving programs which are exempt from the requirements for commercial diving. The guidelines are as follows:

1. The Diving Control Board consists of a majority of active scientific divers and has autonomous and absolute authority over the scientific diving program's operations.

2. The purpose of the project using scientific diving is the advancement of science; therefore, information and data resulting from the project are non-proprietary.

3. The tasks of a scientific diver are those of an observer and data gatherer. Construction and trouble-shooting tasks traditionally associated with commercial diving are not included within scientific diving.

4. Scientific divers, based on the nature of their activities, must use scientific expertise in studying the underwater environment and, therefore, are scientists or scientists in training.

Appendix C to Subpart T of Part 1910 – Alternative Conditions Under § 1910.401(a)(3) for Recreational Diving Instructors and Diving Guides (Mandatory)

Paragraph (a)(3) of § 1910.401 specifies that an employer of recreational diving instructors and diving guides (hereafter, "divers" or "employees") who complies with all of the conditions of this appendix need not provide a decompression chamber for these divers as required under §§ 1910.423(b)(2) or (c)(3) or 1910.426(b)(1):

1. Equipment Requirements for Rebreathers

(a) The employer must ensure that each employee operates the rebreather (i.e., semi-closed-circuit and closed-circuit self-contained underwater breathing apparatuses (hereafter, "SCUBAs")) according to the rebreather manufacturer's instructions.

(b) The employer must ensure that each rebreather has a counterlung that supplies a sufficient volume of breathing gas to their divers to sustain the divers' respiration rates, and contains a baffle system and/or other moisture separating system that keeps moisture from entering the scrubber.

(c) The employer must place a moisture trap in the breathing loop of the rebreather, and ensure that:

(i) The rebreather manufacturer approves both the moisture trap and its location in the breathing loop; and

(ii) Each employee uses the moisture trap according to the rebreather manufacturer's instructions.

(d) The employer must ensure that each rebreather has a continuously functioning moisture sensor, and that:

(i) The moisture sensor connects to a visual (e.g., digital, graphic, analog) or auditory (e.g., voice, pure tone) alarm that is readily detectable by the diver under the diving conditions in which the diver operates, and warns the diver of moisture in the breathing loop in sufficient time to terminate the dive and return safely to the surface; and

(ii) Each diver uses the moisture sensor according to the rebreather manufacturer's instructions.

(e) The employer must ensure that each rebreather contains a continuously functioning CO2 sensor in the breathing loop, and that:

(i) The rebreather manufacturer approves the location of the CO2 sensor in the breathing loop;

(ii) The CO2 sensor is integrated with an alarm that operates in a visual (e.g., digital, graphic, analog) or auditory (e.g., voice, pure tone) mode that is readily detectable by each diver under the diving conditions in which the diver operates; and

(iii) The CO2 alarm remains continuously activated when the inhaled CO2 level reaches and exceeds 0.005 atmospheres absolute (ATA).

(f) Before each day's diving operations, and more often when necessary, the employer must calibrate the CO2 sensor according to the sensor manufacturer's instructions, and ensure that:

(i) The equipment and procedures used to perform this calibration are accurate to within 10% of a CO2 concentration of 0.005 ATA or less;

(ii) The equipment and procedures maintain this accuracy as required by the sensor manufacturer's instructions; and

(iii) The calibration of the CO2 sensor is accurate to within 10% of a CO2 concentration of 0.005 ATA or less.

(g) The employer must replace the CO2 sensor when it fails to meet the accuracy requirements specified in paragraph 1(f)(iii) of this appendix, and ensure that the replacement CO2 sensor meets the accuracy requirements specified in paragraph 1(f)(iii) of this appendix before placing the rebreather in operation.

(h) As an alternative to using a continuously functioning CO2 sensor, the employer may use a schedule for replacing CO2-sorbent material provided by the rebreather manufacturer. The employer may use such a schedule only when the rebreather manufacturer has developed it according to the canister- testing protocol specified below in Condition 11, and must use the canister within the temperature range for which the manufacturer conducted its scrubber canister tests following that protocol. Variations above or below the range are acceptable only after the manufacturer adds that lower or higher temperature to the protocol.

(i) When using CO2-sorbent replacement schedules, the employer must ensure that each rebreather uses a manufactured (i.e., commercially pre-packed), disposable scrubber cartridge containing a CO2-sorbent material that:

(i) Is approved by the rebreather manufacturer;

(ii) Removes CO2 from the diver's exhaled gas; and

(iii) Maintains the CO2 level in the breathable gas (i.e., the gas that a diver inhales directly from the regulator) below a partial pressure of 0.01 ATA.

(j) As an alternative to manufactured, disposable scrubber cartridges, the employer may fill CO2 scrubber cartridges manually with CO2-sorbent material when:

(i) The rebreather manufacturer permits manual filling of scrubber cartridges;

(ii) The employer fills the scrubber cartridges according to the rebreather manufacturer's instructions;

(iii) The employer replaces the CO2-sorbent material using a replacement schedule developed under paragraph 1(h) of this appendix; and

(iv) The employer demonstrates that manual filling meets the requirements specified in paragraph 1(i) of this appendix.

(k) The employer must ensure that each rebreather has an information module that provides:

(i) A visual (e.g., digital, graphic, analog) or auditory (e.g., voice, pure tone) display that effectively warns the diver of solenoid failure (when the rebreather uses solenoids) and other electrical weaknesses or failures (e.g., low battery voltage);

(ii) For a semi-closed circuit rebreather, a visual display for the partial pressure of CO2, or deviations above and below a preset CO2 partial pressure of 0.005 ATA; and

(iii) For a closed-circuit rebreather, a visual display for: partial pressures of O2 and CO2, or deviations above and below a preset CO2 partial pressure of 0.005 ATA and a preset O2 partial pressure of 1.40 ATA or lower; gas temperature in the breathing loop; and water temperature.

(l) Before each day's diving operations, and more often when necessary, the employer must ensure that the electrical power supply and electrical and electronic circuits in each rebreather are operating as required by the rebreather manufacturer's instructions.

2. Special Requirements for Closed-Circuit Rebreathers

(a) The employer must ensure that each closed-circuit rebreather uses supply-pressure sensors for the O2 and diluent (i.e., air or nitrogen) gases and continuously functioning sensors for detecting temperature in the inhalation side of the gas-loop and the ambient water.

(b) The employer must ensure that:

(i) At least two O2 sensors are located in the inhalation side of the breathing loop; and

(ii) The O2 sensors are: functioning continuously; temperature compensated; and approved by the rebreather manufacturer.

(c) Before each day's diving operations, and more often when necessary, the employer must calibrate O2 sensors as required by the sensor manufacturer's instructions. In doing so, the employer must:

(i) Ensure that the equipment and procedures used to perform the calibration are accurate to within 1% of the O2 fraction by volume;

(ii) Maintain this accuracy as required by the manufacturer of the calibration equipment;

(iii) Ensure that the sensors are accurate to within 1% of the O2 fraction by volume;

(iv) Replace O2 sensors when they fail to meet the accuracy requirements specified in paragraph 2(c)(iii) of this appendix; and

(v) Ensure that the replacement O2 sensors meet the accuracy requirements specified in paragraph 2(c)(iii) of this appendix before placing a rebreather in operation.

(d) The employer must ensure that each closed-circuit rebreather has:

(i) A gas-controller package with electrically operated solenoid O2-supply valves;

(ii) A pressure-activated regulator with a second-stage diluent-gas addition valve;

(iii) A manually operated gas-supply bypass valve to add O2 or diluent gas to the breathing loop; and

(iv) Separate O2 and diluent-gas cylinders to supply the breathing-gas mixture.

3. O2 Concentration in the Breathing Gas

The employer must ensure that the fraction of O2 in the Nitrox breathing-gas mixture:

(a) Is greater than the fraction of O2 in compressed air (i.e., exceeds 22% by volume);

(b) For open-circuit SCUBA, never exceeds a maximum fraction of breathable O2 of 40% by volume or a maximum O2 partial pressure of 1.40 ATA, whichever exposes divers to less O2; and

(c) For a rebreather, never exceeds a maximum O2 partial pressure of 1.40 ATA.

4. Regulating O2 Exposures and Diving Depth

(a) Regarding O2 exposure, the employer must:

(i) Ensure that the exposure of each diver to partial pressures of O2 between 0.60 and 1.40 ATA does not exceed the 24-hour single-exposure time limits specified either by the 2001 National Oceanic and Atmospheric Administration Diving Manual (the "2001 NOAA Diving Manual"), or by the report entitled "Enriched Air Operations and Resource Guide" published in 1995 by the Professional Association of Diving Instructors (known commonly as the "1995 DSAT Oxygen Exposure Table"); and

(ii) Determine a diver's O2-exposure duration using the diver's maximum O2 exposure (partial pressure of O2) during the dive and the total dive time (i.e., from the time the diver leaves the surface until the diver returns to the surface).

(b) Regardless of the diving equipment used, the employer must ensure that no diver exceeds a depth of 130 feet of sea water ("fsw") or a maximum O2 partial pressure of 1.40 ATA, whichever exposes the diver to less O2.

5. Use of No-Decompression Limits

(a) For diving conducted while using Nitrox breathing-gas mixtures, the employer must ensure that each diver remains within the no-decompression limits specified for single and repetitive air diving and published in the 2001 NOAA Diving Manual or the report

entitled "Development and Validation of No-Stop Decompression Procedures for Recreational Diving: The DSAT Recreational Dive Planner," published in 1994 by Hamilton Research Ltd. (known commonly as the "1994 DSAT No-Decompression Tables").

(b) An employer may permit a diver to use a dive-decompression computer designed to regulate decompression when the dive- decompression computer uses the no-decompression limits specified in paragraph 5(a) of this appendix, and provides output that reliably represents those limits.

6. Mixing and Analyzing the Breathing Gas

(a) The employer must ensure that:

(i) Properly trained personnel mix Nitrox-breathing gases, and that nitrogen is the only inert gas used in the breathing-gas mixture; and

(ii) When mixing Nitrox-breathing gases, they mix the appropriate breathing gas before delivering the mixture to the breathing-gas cylinders, using the continuous-flow or partial-pressure mixing techniques specified in the 2001 NOAA Diving Manual, or using a filter-membrane system.

(b) Before the start of each day's diving operations, the employer must determine the O2 fraction of the breathing-gas mixture using an O2 analyzer. In doing so, the employer must:

(i) Ensure that the O2 analyzer is accurate to within 1% of the O2 fraction by volume.

(ii) Maintain this accuracy as required by the manufacturer of the analyzer.

(c) When the breathing gas is a commercially supplied Nitrox breathing-gas mixture, the employer must ensure that the O2 meets the medical USP specifications (Type I, Quality Verification Level A) or aviator's breathing-oxygen specifications (Type I, Quality Verification Level E) of CGA G-4.3-2000 ("Commodity Specification for Oxygen"). In addition, the commercial supplier must:

(i) Determine the O2 fraction in the breathing-gas mixture using an analytic method that is accurate to within 1% of the O2 fraction by volume;

(ii) Make this determination when the mixture is in the charged tank and after disconnecting the charged tank from the charging apparatus;

(iii) Include documentation of the O2-analysis procedures and the O2 fraction when delivering the charged tanks to the employer.

(d) Before producing Nitrox breathing-gas mixtures using a compressor in which the gas pressure in any system component exceeds 125 pounds per square inch (psi), the:

(i) Compressor manufacturer must provide the employer with documentation that the compressor is suitable for mixing high- pressure air with the highest O2 fraction used in the Nitrox breathing-gas mixture when operated according to the manufacturer's operating and maintenance specifications;

(ii) Employer must comply with paragraph 6(e) of this appendix, unless the compressor is rated for O2 service and is oil-less or oil-free; and

(iii) Employer must ensure that the compressor meets the requirements specified in paragraphs (i)(1) and (i)(2) of § 1910.430 whenever the highest O2 fraction used in the mixing process exceeds 40%.

(e) Before producing Nitrox breathing-gas mixtures using an oil- lubricated compressor to mix high-pressure air with O2, and regardless of the gas pressure in any system component, the:

(i) Employer must use only uncontaminated air (i.e., air containing no hydrocarbon particulates) for the Nitrox breathing-gas mixture;

(ii) Compressor manufacturer must provide the employer with documentation that the compressor is suitable for mixing the high- pressure air with the highest O2 fraction used in the Nitrox breathing-gas mixture when operated according to the manufacturer's operating and maintenance specifications;

(iii) Employer must filter the high-pressure air to produce O2-compatible air;

(iv) The filter-system manufacturer must provide the employer with documentation that the filter system used for this purpose is suitable for producing O2-compatible air when operated according to the manufacturer's operating and maintenance specifications; and

(v) Employer must continuously monitor the air downstream from the filter for hydrocarbon contamination.

(f) The employer must ensure that diving equipment using Nitrox breathing-gas mixtures or pure O2 under high pressure (i.e., exceeding 125 psi) conforms to the O2-service requirements specified in paragraphs (i)(1) and (i)(2) of § 1910.430.

7. Emergency Egress

(a) Regardless of the type of diving equipment used by a diver (i.e., open-circuit SCUBA or rebreathers), the employer must ensure that the equipment contains (or incorporates) an open-circuit emergency-egress system (a "bail-out" system) in which the second stage of the regulator connects to a separate supply of emergency breathing gas, and the emergency breathing gas consists of air or the same Nitrox breathing-gas mixture used during the dive.

(b) As an alternative to the "bail-out" system specified in paragraph 7(a) of this appendix, the employer may use:

(i) For open-circuit SCUBA, an emergency-egress system as specified in § 1910.424(c)(4); or

(ii) For a semi-closed-circuit and closed-circuit rebreather, a system configured so that the second stage of the regulator connects to a reserve supply of emergency breathing gas.

(c) The employer must obtain from the rebreather manufacturer sufficient information to ensure that the bail-out system performs reliably and has sufficient capacity to enable the diver to terminate the dive and return safely to the surface.

8. Treating Diving-Related Medical Emergencies

(a) Before each day's diving operations, the employer must:

(i) Verify that a hospital, qualified health-care professionals, and the nearest Coast Guard Coordination Center (or an equivalent rescue service operated by a state, county, or municipal agency) are available to treat diving-related medical emergencies;

(ii) Ensure that each dive site has a means to alert these treatment resources in a timely manner when a diving-related medical emergency occurs; and

(iii) Ensure that transportation to a suitable decompression chamber is readily available when no decompression chamber is at the dive site, and that this transportation can deliver the injured diver to the decompression chamber within four (4) hours travel time from the dive site.

(b) The employer must ensure that portable O2 equipment is available at the dive site to treat injured divers. In doing so, the employer must ensure that:

(i) The equipment delivers medical-grade O2 that meets the requirements for medical USP oxygen (Type I, Quality Verification Level A) of CGA G-4.3-2000 ("Commodity Specification for Oxygen");

(ii) The equipment delivers this O2 to a transparent mask that covers the injured diver's nose and mouth; and

(iii) Sufficient O2 is available for administration to the injured diver from the time the employer recognizes the symptoms of a diving-related medical emergency until the injured diver reaches a decompression chamber for treatment.

(c) Before each day's diving operations, the employer must:

(i) Ensure that at least two attendants, either employees or non-employees, qualified in first-aid and administering O2 treatment, are available at the dive site to treat diving-related medical emergencies; and

(ii) Verify their qualifications for this task.

9. Diving Logs and No-Decompression Tables

(a) Before starting each day's diving operations, the employer must:

(i) Designate an employee or a non-employee to make entries in a diving log; and

(ii) Verify that this designee understands the diving and medical terminology, and proper procedures, for making correct entries in the diving log.

(b) The employer must:

(i) Ensure that the diving log conforms to the requirements specified by paragraph (d) ("Record of dive") of § 1910.423; and

(ii) Maintain a record of the dive according to § 1910.440 ("Recordkeeping requirements").

(c) The employer must ensure that a hard-copy of the no- decompression tables used for the dives (as specified in paragraph 6(a) of this appendix) is readily available at the dive site, whether or not the divers use dive-decompression computers.

10. Diver Training

The employer must ensure that each diver receives training that enables the diver to perform work safely and effectively while using open-circuit SCUBAs or rebreathers supplied with Nitrox breathing- gas mixtures. Accordingly, each diver must be able to demonstrate the ability to perform critical tasks safely and effectively, including, but not limited to: recognizing the effects of breathing excessive CO2 and O2; taking appropriate action after detecting excessive levels of CO2 and O2; and properly

evaluating, operating, and maintaining their diving equipment under the diving conditions they encounter.

11. Testing Protocol for Determining the CO2 Limits of Rebreather Canisters

(a) The employer must ensure that the rebreather manufacturer has used the following procedures for determining that the CO2-sorbent material meets the specifications of the sorbent material's manufacturer:

(i) The North Atlantic Treating Organization CO2 absorbent-activity test;

(ii) The RoTap shaker and nested-sieves test;

(iii) The Navy Experimental Diving Unit ("NEDU")-derived Schlegel test; and
(iv) The NEDU MeshFit software.

(b) The employer must ensure that the rebreather manufacturer has applied the following canister-testing materials, methods, procedures, and statistical analyses:

(i) Use of a Nitrox breathing-gas mixture that has an O2 fraction maintained at 0.28 (equivalent to 1.4 ATA of O2 at 130 fsw, the maximum O2 concentration permitted at this depth);

(ii) While operating the rebreather at a maximum depth of 130 fsw, use of a breathing machine to continuously ventilate the rebreather with breathing gas that is at 100% humidity and warmed to a temperature of 98.6 degrees F (37 degrees C) in the heating- humidification chamber;

(iii) Measurement of the O2 concentration of the inhalation breathing gas delivered to the mouthpiece;

(iv) Testing of the canisters using the three ventilation rates listed in Table I below (with the required breathing-machine tidal volumes and frequencies, and CO2-injection rates, provided for each ventilation rate):

Table I. -- Canister Testing Parameters

Ventilation rates (Lpm, ATPS1)	Breathing machine tidal volumes (L)	Breathing machine frequencies (breaths per min.)	CO2 injection rates (Lpm, STPD2)
22.5 40.0 62.5	1.5 2.0 2.5	15 20 25	0.90 1.35 2.25

1 ATPS means ambient temperature and pressure, saturated with water.

2 STPD means standard temperature and pressure, dry; the standard temperature is 32 degrees F (0 degrees C).

(v) When using a work rate (i.e., breathing-machine tidal volume and frequency) other than the work rates listed in the table above, addition of the appropriate combinations of ventilation rates and CO2-injection rates;

(vi) Performance of the CO2 injection at a constant (steady) and continuous rate during each testing trial;

(vii) Determination of canister duration using a minimum of four (4) water temperatures, including 40, 50, 70, and 90 degrees F (4.4, 10.0, 21.1, and 32.2 degrees C, respectively);

(viii) Monitoring of the breathing-gas temperature at the rebreather mouthpiece (at the "chrome T" connector), and ensuring that this temperature conforms to the temperature of a diver's exhaled breath at the water temperature and ventilation rate used during the testing trial;[1]

(ix) Implementation of at least eight (8) testing trials for each combination of temperature and ventilation-CO2- injection rates (for example, eight testing trials at 40 degrees F using a ventilation rate of 22.5 Lpm at a CO2-injection rate of 0.90 Lpm);

(x) Allowing the water temperature to vary no more than 2.0 degrees F (1.0 degree C) between each of the eight testing trials, and no more than 1.0 degree F (0.5 degree C) within each testing trial;

(xi) Use of the average temperature for each set of eight testing trials in the statistical analysis of the testing-trial results, with the testing-trial results being the time taken for the inhaled breathing gas to reach 0.005 ATA of CO2 (i.e., the canister-duration results);

(xii) Analysis of the canister-duration results using the repeated-measures statistics described in NEDU Report 2-99;

(xiii) Specification of the replacement schedule for the CO2-sorbent materials in terms of the lower prediction line (or limit) of the 95% confidence interval; and

(xiv) Derivation of replacement schedules only by interpolating among, but not by extrapolating beyond, the depth, water temperatures, and exercise levels used during canister testing.

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[1] NEDU can provide the manufacturer with information on the temperature of a diver's exhaled breath at various water temperatures and ventilation rates, as well as techniques and procedures used to maintain these temperatures during the testing trials.