Diving Standards for Underwater Operations
TEXAS A&M UNIVERSITY - CORPUSS CHRISTI

EDITOR/AUTHOR
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FOREWORD

Because Texas A&M University–Corpus Christi (hereafter TAMUCC or university) has established an employer-employee relationship, compliance with OSHA Standard 29 is mandatory. As a result, diving engaged in by TAMUCC staff requires compliance with CFR 1910 Subpart T, Standards for Commercial Dive Operations. For further guidance with procedural compliance, TAMUCC looked to the Association of Diving Contractors (ADC) Consensus Standards for Commercial Diving and Underwater Operations and the American Academy of Underwater Sciences (AAUS) Standards for Scientific Diving. These two organizations are recognized by OSHA as having representative dive standards exemplary in their areas of expertise. Additional Standards of view were gleaned from the National Oceanic & Atmospheric Administration’s (NOAA) Working & Scientific Diving Standards and Safety Manuals.

This manual sets forth the policies, procedures, and standards which govern training and diving operations of all persons participating in the TAMUCC diving program. It applies to all divers operating under university auspices, including all visiting divers, all individuals who wish to dive at university facilities, all divers using university equipment, and to those university officials responsible for the management and administration of the dive program. Furthermore this manual was written to ensure all diving under the auspices of TAMUCC is conducted in a manner that protects all divers from accidental injury and/or illness.

As ADC’s Forward states, ‘it is assumed that no set of standard procedures can anticipate all operating conditions that may be encountered and, consequently, no user of these Standards (in this context, TAMUCC’s) may assume safe operation simply by following the guidelines’. TAMUCC’s mechanism for determining which standard a dive operation will follow for these cases will be the authority vested to its Diving Control Board and Diving Safety Officer. ADC proceeds to state, “No standard can ever substitute for common sense, sound judgment, or a continuing concern for safety. Deviation from standards and codes will always be made on the side of increasing safety.” This responsibility is vested in all.

It is important for all TAMUCC divers to realize that the regulations of this manual are intended to provide for their safety and maximize their personal protection.

For the divers that will operate under this umbrella of safety, special thanks are offered to the colleagues, advisors, and TAMUCC staff who took the time to help edit this document.

Brett W. Dodson
Diving Safety Officer
Texas A&M University - Corpus Christi
# Record of Changes

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<td>Re-write of the original “Dive Safety Manual” as Edited by Kevin B. Strychar, Ph.D. and the TAMUCC Diving Control Board, by Quenton Dokken, Ph.D., and subsequently renamed “Texas A&amp;M University–Corpus Christi Manual of Scientific Diving Guidelines”.</td>
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<td>01/15/2014</td>
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<td>Incorporation of AAUS Standards Committee edits.</td>
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<td>02/01/2014</td>
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<td>AAUS approves TAMUCC as Organizational Member.</td>
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DIVING CONTROL BOARD

TEXAS A&M UNIVERSITY - CORPUS CHRISTI DIVING CONTROL BOARD, 2013

The role of the Texas A&M University - Corpus Christi Diving Control Board is to enact policies and procedures, and to govern training and dive operations of all personnel participating in the TAMUCC diving program. DCB oversight will apply to all divers operating under university auspices, including all visiting divers, all individuals who wish to dive at TAMUCC facilities or from TAMUCC vessels, all divers using TAMUCC equipment, and to those TAMUCC officials responsible for the management and administration of research and diving programs.

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<tr>
<td>Luis Cifuentes</td>
<td>Vice President: Division of Research, Commercialization, and Outreach</td>
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<tr>
<td>Diving Certification(s):</td>
<td>Non-diver</td>
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<tr>
<td>Brett Dodson, Chair</td>
<td>Diving Safety Officer and Scientific Diver</td>
</tr>
<tr>
<td>Diving Certification(s):</td>
<td>PADI Instructor, Scientific Diver, DAN FA/CPR/O2 Instructor, AHA FA/CPR Instructor</td>
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<tr>
<td>Larry McKinney</td>
<td>Executive Director: Harte Research Institute for Gulf of Mexico Studies</td>
</tr>
<tr>
<td>Diving Certification(s):</td>
<td>NAUI Instructor Trainer (retired), PADI Instructor Trainer (retired)</td>
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<td>Roy Coons</td>
<td>Director, Environmental, Health &amp; Safety</td>
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<tr>
<td>Diving Certification(s):</td>
<td>PADI Dive Master</td>
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<tr>
<td>James Hogan</td>
<td>Assistant Professor, Dept. of Life Sciences, College of Science &amp; Engineering</td>
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<td>Diving Certification(s):</td>
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<td>Henry D. Judah</td>
<td>Associate Director of Texas A&amp;M System Risk Management</td>
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<td>Research Specialist II, Conrad Blucher Institute</td>
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<td>Terry Palmer</td>
<td>Research Associate, Harte Research Institute</td>
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<td>Colette Simon</td>
<td>Director of Hyperbarics, Christus Spohn Wound Care &amp; Hyperbarics</td>
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<td>Jennifer Wetz</td>
<td>Fisheries Project Manager, Fisheries &amp; Ocean Health, Hart Research Institute</td>
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<tr>
<td>Diving Certification(s):</td>
<td>PADI Advanced OW, Rescue, SSI EANx Diver, AHA FA/CPR/O2</td>
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Section 1.0

General Provisions
1.0 **GENERAL PROVISIONS**

1.1 **SCOPE**

The following rules and regulations apply to all individuals who dive under the auspices of Texas A&M University - Corpus Christi (TAMUCC or University) regardless of the geographic location or the specific underwater tasks performed. They apply to all individuals, regardless of ownership, who may use for any purpose, diving equipment or apparatus, during TAMUCC sponsored activities, diving at TAMUCC facilities or from TAMUCC vessels.

1.1.1 **Working vs. Scientific Dives**

The Dive Safety Officer, Diving Control Board, or designee, will be responsible for determining whether dive operations are conducted under working or scientific guidelines as defined by OSHA in CFR 1910.401(a)(2) (Section 11.0). This will be done by review of the Dive Plan (Section 4.23). The following criteria will be used to distinguish between working and scientific dives. A negative answer to any of the following questions will require the task to be conducted as a working dive, by divers of Working Diver status (Section 3.1.3), and pursuant to the standards outlined in this manual.

(a) 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?
(b) Do the tasks require the expertise of a scientist or scientist in training?
(c) Can the tasks be accomplished with minimal physical exertion?
(d) Can the tasks be accomplished in short time (e.g., <1-hour)?
(e) Are the tasks limited solely to the observation of natural phenomena or responses of natural systems and/or gathering of data for scientific analysis?
(f) Objects to be lifted or moved, have underwater weight <100 pounds?
(g) Will the tasks result in the advancement of science?

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

1.1.2 **Training and Certification**

Individuals are not authorized to dive under university auspices until they meet the requirements for diving pertinent to the level of the proposed activity as outlined in this manual and granted dive status by the Diving Control Board and/or Diving Safety Officer.

1.1.3 **Equipment**

All diving under university auspices will be done with equipment that conforms to the standards set forth in Section 7.0 of this manual regardless of ownership.

1.1.4 **Revocation of Diving Permission**

TAMUCC may revoke dive privileges for failure to comply with any regulation contained herein, or non-compliance with any pertinent regulations or laws.

1.2 **PURPOSE**

1.2.1 **The Dive Safety Program**

The purpose of the dive safety program is to:

(a) Ensure the safety of all divers participating in associated programs at TAMUCC and take all reasonable actions to facilitate the safe and effective participation of scientists and student researchers in diving activities necessary for research or educational purposes.

(b) TAMUCC will provide training options for both, divers who wish to meet the minimum training requirements pertinent to the level of the proposed diving activity, as outlined in the TAMUCC Diving Standards for Underwater Operations manual, and divers wishing to develop new skills and build on ones already learned.

(a) Ensure all diving under the auspices of TAMUCC is conducted in a manner most likely to minimize the risk of injury or occupational illness by complying with standards of safety established by nationally recognized agencies.
(b) Set forth rules, regulations, and standards for training and certification allowing compliance with the Occupational Safety and Health Administration (OSHA) standards for Commercial Diving Operations (29 CFR 1910 Subpart T).

(c) Set standards for the establishment of an American Academy of Underwater Sciences (AAUS) recognized scientific diving program, organization for the conduct of this program, and basic regulations and procedures for safety in TAMUCC scientific dive operations. Observance of these standards establish a framework for reciprocity between other institutions, state and federal agencies, Aquariums and Zoos, and AAUS member organizations engaged in scientific diving that adhere to these minimum standards.

1.2.2 The Safe Practices Manual - TAMUCC Diving Standards for Underwater Operations

TAMUCC’s Safe Practices Manual is titled *TAMUCC Diving Standards for Underwater Operations*. TAMUCC will maintain copies of this manual, via the Diving Control Board and Diving Safety Officer (Sections 1.3.2.7 and 1.3.3.2 respectively), OSHA’s Commercial Diving Standards (29 CFR1910 Subpart T), and AAUS’s Standards for Scientific Diving, and make them available at the dive location and to each dive team member.

The purpose of the TAMUCC Diving Standards for Underwater Operations manual is to document basic dive policy, organization, regulations, and procedures for all TAMUCC related dive operations including, but not limited to, the following:

(a) Establishing emergency response, evacuation, and medical treatment procedures for fire, equipment failure, and adverse environmental conditions.

(b) Setting criteria for diver training and certification.

(c) Outline general safety procedures and checklists for all TAMUCC related dive operations.

(d) Determining assignments and responsibilities of dive team members.

(e) Establishing equipment and maintenance procedures and checklists.

1.2.3 Supplementary University Guidelines or Manuals

Diving conducted under the auspices of TAMUCC will comply with the TAMUCC Standards and Operations Manual regulations. For any dive related operation not specifically addressed in the TAMUCC Manual, final interpretation of conflicting or unclear standards will fall to OSHA Standard 29 CFR 1910 Subpart T, *Commercial Diving Operations* (Section 11.0), and AAUS’s *Standards for Scientific Diving* (Section 12.0), or Association of Dive Contractors (ADC) *Consensus Standards for Commercial Diving and Underwater Operations*.

An immediate judgment may be provided by the Diving Safety Officer until the Diving Control Board can meet, review, and make a final ruling on said conflict. All TAMUCC dive operations will aspire to meet the higher standard as established by national regulations, OSHA recognized associations, and/or the individual requirements determined by the Dive Plan.

1.2.4 Consequences of Violations of Regulations

It is TAMUCC’s obligation to comply with the Commercial Diving Operation standards outlined by OSHA and, as an organizational member of AAUS, their Standards for Scientific Diving. Failure to meet these guidelines can result in suspension of all diving related operations and in some case, fines may be levied. Failure to comply with these procedures may also be cause for revocation or restriction of TAMUCC’s Organizational Member status, as recognized by AAUS. Therefore, if an individual fails to comply with TAMUCC diving regulations, the TAMUCC Diving Control Board may elect to restrict or revoke their dive status.

1.3 AUTHORITY AND RESPONSIBILITY

1.3.1 Diving Control Board (DCB)

1.3.1.1 Ultimate Authority

The DCB per OSHA CFR 1910, Subpart T, will exercise autonomous and absolute authority over all TAMUCC dive operations.
1.3.1.2 General
The DCB:
(a) Is an appointed board of representatives from TAMUCC’s Colleges and Research Institutes.
(b) Is responsible for providing surveillance of all TAMUCC dive activities, including the interpretation and development of additional university dive policies, regulations, and standards.
(c) Shall meet no less than quarterly and on an as-needed basis to address time sensitive issues.

1.3.1.3 Composition and Qualifications
The DCB:
(a) Will consist of two groups, voting members, and non-voting advisors.
(b) Voting members:
   (1) Shall include the Responsible Administrative Officer, or designee, the DSO, and other representatives of the dive program.
   (2) Shall be made up of a majority of active scientific divers.
   (3) Be chaired by the Dive Safety Officer.
(c) Non-voting members:
   (1) Are appointed individual advisors or advisory panels with subject matter expertise to provide additional information.
   (2) Shall be appointed by the Chairperson and approved by majority vote of the membership.
   (3) A secretary will be chosen by the Chairperson to assist the DCB administratively.

1.3.1.4 Selection
The President of Texas A&M University - Corpus Christi or the President’s delegated Responsible Administrative Officer, with the advice of the DSO, will annually appoint/reappoint representative DCB voting members.
(a) Current or prospective voting members will annually submit, to the President or the Responsible Administrative Officer, a Letter Of Intent (LOI) to remain/assume a seat on the board.
(b) An approved request will be answered within 30 days of submission of the LOI with an offer of continued board service or invitation to sit in the case of a prospective member.

1.3.1.5 Decision Making Process
(a) The Chairperson will strive for consensus on all issues and decisions, and every attempt will be made to query each voting member of the board 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 will be made by majority vote with the Chairperson casting the deciding vote in case of a tie.
(d) Major objections to majority votes will be made part of the meeting minutes. Any voting member of the board may request that an item be raised to the President via written communication from the Responsible Administrative Officer and Chair.

1.3.1.6 Term Limits
(a) The Responsible Administrative Officer/Designee and DSO are non-rotating members of the DCB.
(b) All other members may serve a maximum of five consecutive years.
(c) It is preferred no more than one voting member rotates off the DCB annually.
1.3.1.7 Responsibilities

The DCB has the responsibility to:

(a) Review and revise the TAMUCC Diving Standards for Underwater Operations and Operations manual and assure total compliance.
(b) Approve and monitor dive projects.
(c) Ensure the TAMUCC dive program and projects are covered by the appropriate institutional insurance (Section 1.5).
(d) Establish and/or approve training programs through which applicants for dive status can satisfy the requirements of this manual.
(e) Take disciplinary action for unsafe dive practices, and act as a board of appeal to consider diver-related problems.
(f) Approve locations where diving may be conducted under university auspices.
(g) Establish criteria for equipment selection and use, and recommend new equipment and techniques for university use.
(h) Establish and/or approve facilities for the inspection and maintenance of all scuba and associated equipment (including gas stations and quality standards).
(i) Suspend dive programs considered unsafe or unwise.
(j) Act as official representative of TAMUCC in matters concerning the diving program.
(k) Recommend the issue, re-issue, and revocation of diving certifications.
(l) Screen and appoint all personnel involved in diving instruction under the auspices of TAMUCC.
(m) Act as official representative of TAMUCC when recommending policy changes and amendments to AAUS, in scientific diving matters.
(n) Sit as a board of investigation to inquire into the nature and cause of diving accidents or violations of TAMUCC Diving Standards for Underwater Operations Manual.
(o) Periodically review the DSO’s performance.
(p) Shall certify the depths to which a diver has been trained and buddy system will be adhered to.

1.3.2 Diving Safety Officer (DSO)

The DSO will hold a broad knowledge base in all aspects of diving and diving technology. The DSO will possess a broad technical and scientific expertise in research and research related diving. The DSO’s level of knowledge and diving skills will span the reach of TAMUCC’s dive program, qualifying them to perform any aspect of program operation.

1.3.2.1 Qualifications

The DSO will:

(a) Be appointed by the President of Texas A&M University–Corpus Christi or the designated representative (i.e. Responsible Administrative Officer or designee) with the advice of the DCB.
(b) Be a TAMUCC employee who is an active scientific diver.
(c) Be a full member of AAUS.
(d) Be an active underwater instructor from an internationally recognized agency.

1.3.2.2 Responsibilities

The DSO:

(a) Will serve as Chairman of the DCB, and as such, will prepare recommendations for consideration by the DCB.
(b) Will be responsible, although guided in the performance of the required duties by the advice of the DCB, for the conduct of the TAMUCC dive program. The routine operational authority for this program, including the conduct of training and certification, approval of dive plans,
maintenance of dive records, ensuring compliance with this standard, and all relevant regulations, rests with the DSO.
(c) May assign qualified individuals to carry out portions of the dive program, but cannot delegate responsibility for its safe conduct.
(d) Will provide annual audits of all dive program records pertaining to safety and instructional standards.
(e) Will prepare and submit annual reports of university dive activities as required.
(f) Has the authority to suspend dive programs deemed unsafe.

1.3.3 Instructional Personnel
All non-university personnel involved in dive instruction, training, and operational oversight under the auspices of TAMUCC will:
(a) Be qualified for the position.
(b) Instruct under the standards of an internationally recognized dive training agency or under the minimum guidelines presented by the most current version of the RSTC/ISO Entry Level Diver Standards.
(c) Be screened and approved by the DCB prior to service.

1.3.4 Reciprocity and Visiting Scientific Divers
Regarding reciprocity and visiting divers, the following will apply:
(a) If TAMUCC engages jointly in dive activities with other Organizations/Facilities, or engages jointly in the use of diving resources, one of the participating Diving Safety Boards will be mutually agreed upon to govern the joint dive project.
(b) A diver from another Organization/Facility may apply for permission to dive under the auspices of TAMUCC.

The diver:
(1) Will submit to the DSO a completed Appendix 1.A, signed by the Diving Officer or Chair of their home DCB.
(2) Prior to participation, the visiting diver may be asked to:
   (i) Provide further documentation as outlined in Section 3.1.2 Temporary Diver.
   (ii) Demonstrate their knowledge of diving.
   (iii) Demonstrate diving skills.
(3) If denied permission to dive, the TAMUCC DSO will notify the diver and their home DCB with an explanation of all reasons for the denial.

1.4 Waiver of Requirements
The DCB or the DSO may grant a waiver for specific requirements of training, examinations, depth certifications, and minimum activity to maintain dive status.
If the diver’s entry-level training was not under the control of TAMUCC, the DSO or designee may evaluate the diver and verify they possess knowledge and skills substantially similar to those stated above.

1.5 Diving Medical Insurance
TAMUCC appropriately insures all approved divers diving under university auspices and it is the DCB’s responsibility to ensure this coverage will be in effect at the appropriate time. TAMUCC requires all divers diving under the auspices of TAMUCC personally obtain a supplemental diving insurance policy (e.g. coverage by Divers Alert Network) and ensure it is in effect during periods of diving activity. Coverage will cover the costs of transportation and treatment at hyperbaric and hospital facilities.

1.6 Staff Liability
To the degree allowed by state law and university policy, individuals acting or diving in an official capacity and on behalf of TAMUCC will be supported and protected against claims of liability and/or wrong doing.
**APPENDIX 1.A**

**DIVE RECIPROCITY FORM**

This letter is to confirm the standing of ________________ as a Diver with Texas A&M University - Corpus Christi (TAMUCC). TAMUCC adheres to the standards set forth by OSHA CFR 1910 and as an Organizational Member of the American Academy of Underwater Sciences (AAUS), their standards governing Scientific Diving. The Diver's standing in the TAMUCC Dive Program follows:

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<thead>
<tr>
<th>Diver Authorization:</th>
<th>Status</th>
<th>Approval Date</th>
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<tr>
<td>Active in the TAMUCC Program since</td>
<td>In-Active</td>
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<tr>
<td>This Diver's depth certification is presently:</td>
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**Diver’s Emergency Contact**

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<thead>
<tr>
<th>Relationship</th>
<th>Phone</th>
<th>Phone (alternate)</th>
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<tr>
<td>Brett W. Dodson</td>
<td>Dive Safety Officer</td>
<td>361-825-3086</td>
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**Requisite Training:**

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<td>AED</td>
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<tr>
<td>O2 Provider</td>
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<tr>
<td>Neuro Assessment</td>
<td></td>
<td></td>
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<tr>
<td>Blood Borne Path.</td>
<td></td>
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</tr>
<tr>
<td>Other</td>
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<td></td>
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<tr>
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<tr>
<td>AAUS Individual Member?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Medical Exam</td>
<td>Date</td>
<td>Expiration Date</td>
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</tr>
<tr>
<td>Highest Level Diving Certification:</td>
<td>Level</td>
<td>Agency</td>
<td>Date</td>
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**Additional Diving Authorizations and experience:**

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<td>Open water</td>
<td>Cave/rm</td>
<td>Photography</td>
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<td>Recreation</td>
<td>Confined</td>
<td>Wreck</td>
<td>Navigation</td>
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<td>SCUBA</td>
<td>Shore</td>
<td>Dry suit</td>
<td>Altitude</td>
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<td>Surf. Sup.</td>
<td>Boat</td>
<td>Full Face Mask</td>
<td>Search/recovery</td>
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<tr>
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<td>Platform</td>
<td>Hard Hat</td>
<td>Rescue</td>
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<td>Hookah</td>
<td>Buoyed Dl.</td>
<td>Communications</td>
<td>Decompression</td>
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<td>Nitrox</td>
<td>Free Descent</td>
<td>Low visibility</td>
<td>Blue water</td>
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<tr>
<td>Trimix</td>
<td>Bottom Orient.</td>
<td>Current</td>
<td>Saturation</td>
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<td>Water Column</td>
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<tr>
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</table>

**Diving Activity:**

<table>
<thead>
<tr>
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<th>Number of dives in past 12-months</th>
</tr>
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</table>

**Equipment Service:**

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<tr>
<th>Manufacturer</th>
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<tbody>
<tr>
<td>Regulator</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>First Stage</td>
<td></td>
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<tr>
<td>Second Stage</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Back-up</td>
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<tr>
<td>Buoyancy Comp.</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**Diving Officer’s Comments:**

<table>
<thead>
<tr>
<th>Project Description, Location, Dates:</th>
</tr>
</thead>
</table>

This document is verification of diver training and current standing only. It does not verify employment status with, ________________.

Best Regards,

Dive Safety Officer

Office Phone:

Email:
Section 2.0

Training and Certification Requirements
2.0 ENTRY LEVEL TRAINING REQUIREMENTS

2.1 ELIGIBILITY
This section describes, in order, the entry-level training requirements a diver or prospective diver applicant will need before their application for TAMUCC dive status (Section 3.0) is considered complete.

2.1.1 Application
To participate in the TAMUCC diving program, a diver or prospective diver will submit a complete application. The following guidelines apply:

(a) Application will be made to the DSO on the form prescribed by TAMUCC policy (see Appendix 2.A or, in a case of reciprocity, Appendix 1.A).
(b) Only employees of TAMUCC may apply for, and participate in, entry-level dive training under the auspices of the University. Applications will be considered on a case-by-case basis. Instructors will meet the criteria outlined in Section 1.3.4 and 2.2.
(c) University and non-university personnel may participate in advanced dive activities on a continuing education basis with permission of the DCB and/or the DSO.

NOTE: An applicant for dive status will be at least eighteen (18) years of age.

2.1.2 Diver Certification
The Applicant must, at a minimum, show documented proof of entry-level diver certification from an internationally recognized training agency or the minimum guidelines presented by the most current version of the RSTC/ISO Entry Level Diver Standards.

2.1.3 Medical Evaluation
To participate in the TAMUCC diving program, a diver or prospective diver will submit a complete medical evaluation prior to any in-water activity (Section 8.0 and Appendix 8.A-D). This evaluation will include:

(a) A Diving Medical Exam Overview filled out and signed by the DSO and presented to the physician prior to the exam.
(b) A Medical Evaluation Report of Fitness completed, signed, and dated by a licensed physician, based on an approved medical examination attesting to the applicant’s fitness for diving.
(c) A Release of Medical Information Form signed and dated by the applicant.
(d) A Diving Medical History Form filled out and signed by the applicant and presented to the physician prior to the exam.

2.1.4 Liability Release Waiver
To participate in the TAMUCC diving program, a diver or prospective diver will submit the required liability release form prior to participation in training, research, or recreational diving under the auspices of TAMUCC (Appendix 2.B). The DSO may require additional releases and waivers depending on the training activity. Such forms, if required, will be approved by the DCB and submitted prior to participation in the activity.

2.1.5 Swimming Evaluation
Applicants will successfully demonstrate they possess reasonable aquatic ability by performing the following swimming and skin diving skills, or their equivalent, in the presence of the DSO, or an examiner approved by the DSO:

(a) Swim underwater for a distance of 25 yards (23 m) without surfacing.
(b) Swim 400 yards (366 m) in less than 12 minutes, without swimming aids.
(c) Without the use of swimming aids, tread water for 10 minutes, or two minutes without the use of hands.
(d) Without the use of swimming aids, transport another person of equal size a distance of 25 yards (23 m) in the water.
NOTE: All swimming and skin diving skills will be completed satisfactorily in a single session. If an applicant is unable to complete the tests, a retest can be scheduled no sooner than one month from the date of an incomplete test.

2.2 **ADDITIONAL TRAINING REQUIREMENTS**

Each applicant for dive status through TAMUCC will hold current certifications, or the equivalent, in:

(a) Standard First Aid.
(b) Cardiopulmonary Resuscitation (Adult CPR and AED).
(c) Field Neurological Exam.
(d) Oxygen Provider certifications.
(e) Blood Borne Pathogens.
(f) Hold a current diving insurance policy as addressed in (Section 1.5)
# Appendix 2.A
## Dive Program Application

### Dive Status:
Relationship to organization (Faculty, Staff, Student, Visitor)

<table>
<thead>
<tr>
<th>Original AAUS dive authorization from</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active in the TAMUCC Program since</td>
<td></td>
</tr>
<tr>
<td>This Dive Status is presently</td>
<td></td>
</tr>
<tr>
<td>This Diver's depth certification is presently:</td>
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### Classification:

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<tr>
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</tr>
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## Personal Information:

Name

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<tr>
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</tr>
<tr>
<td>City</td>
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</tr>
<tr>
<td>Telephone</td>
<td>Telephone (Alt)</td>
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Emergency Contact

| Address | E-mail |
| City | State | Zip |
| Telephone | Telephone (Alt) |

### Diving certifications: List Highest to lowest.

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### Ancillary Diving Certifications:

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<td>Dive Insurance</td>
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<tr>
<td>AAUS Individual Member?</td>
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<thead>
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<td>--------------------------------------</td>
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<tr>
<td>Date of last dive</td>
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<td>Years diving</td>
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<td>Recreation</td>
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<td>Rebreather</td>
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<td>Hookah</td>
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<td>Nitrox</td>
<td>Free Descent</td>
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<td>Trimix</td>
<td>Low visibility</td>
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<td>Computer</td>
<td>Artificial Reef</td>
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<td>Additional experience:</td>
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<tr>
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<td>Describe diving experience not covered above.</td>
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<table>
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<th>Equipment owned:</th>
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<td>Regulator</td>
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<td>Dry Suit</td>
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Fill out when personal equipment will be used for TAMUCC sanctioned diving. Consult DSO for instructions on adding additional pieces of equipment. Personal equipment used on TAMUCC sanctioned diving is subject to the same rules and regulations required of facility owned equipment, i.e. configuration, compatibility, and maintenance. The DSO will be informed if one personal item is to be swapped out with another personal item. The exchange will be recorded and filed in Diver’s file.
APPENDIX 2.B

WAIVER, INDEMNIFICATION, AND MEDICAL TREATMENT AUTHORIZATION FORM

Texas A&M University - Corpus Christi

EXCULPATORY CLAUSE. In consideration for receiving permission to participate in any and all activities of Diving (herein referred to as “activity”), which is sponsored by Texas A&M University – Corpus Christi (herein referred to as “sponsor”), a member of The Texas A&M University System, I hereby release, waive, discharge, covenant not to sue, and agree to hold harmless for any and all purposes sponsor, The Texas A&M University System, the Board of Regents for The Texas A&M University System, and their members, officers, servants, agents, volunteers, or employees (herein referred to as RELEASEES or INDEMNITERS) from any and all liabilities, claims, demands, injuries (including death), or damages, including court costs and attorney’s fees and expenses, that may be sustained by me while participating in such activity, while traveling to and from the activity, or while on the premises owned or leased by RELEASEES, including injuries sustained as a result of the sole, joint, or concurrent negligence, negligence per se, statutory fault, or strict liability of RELEASEES. I understand this waiver does not apply to injuries caused by intentional or grossly negligent conduct.

INDEMNITY CLAUSE. I am fully aware that there are inherent risks to myself and others involved with this activity, including but not limited to:

Barotraumas, Drowning, Asphyxiation, Hyperthermia, Hypothermia, and Type I & II Decompression sickness

and I choose to voluntarily participate in said activity with full knowledge that the activity may be hazardous to me, my property, and to the person and property of others. I acknowledge there may be physically strenuous activities. I know of no medical reason why I should not participate. I agree to indemnify and hold harmless INDEMNITERS from any and all liabilities, claims, demands, injuries (including death), or damages, including court costs and attorney’s fees and expenses, which may occur to myself, other participants, and third-persons as a result of my participation in said activity, including injuries sustained as a result of the sole, joint, or concurrent negligence, negligence per se, statutory fault, or strict liability of INDEMNITERS.

NO INSURANCE. I understand that RELEASEES do not maintain any insurance policy covering any circumstance arising from my participation in this activity or any event related to that participation. As such, I am aware that I should review my personal insurance coverage. Sponsor does not carry general liability insurance to cover claims arising from this activity so it seeks a waiver of claims as additional consideration for the right to participate so sponsor, a governmental unit of the State of Texas, can (a) provide the activity at the lowest possible cost to participants; and (b) provide access to a greater number of participants by expending limited resources on program materials rather than on liability insurance.

BINDS HEIRS. It is my express intent that this agreement shall bind the members of my family and spouse, if I am alive, and my heirs, assigns and personal representatives, if I am deceased, and shall be governed by the laws of the State of Texas.

MEDICAL AUTHORIZATION, INDEMNITY FOR MEDICAL EXPENSES, and WAIVER. I understand RELEASEES cannot be expected to control all of the risks articulated in this form and RELEASEES may need to respond to accidents and potential emergency situations. Therefore, I hereby give my consent for any medical treatment that may be required, as determined by a medical professional at the medical facility, during my participation in this activity with the understanding that the cost of any such treatment will be my responsibility. I agree to indemnify and hold harmless INDEMNITERS for any costs incurred to treat me, even an INDEMNITEE has signed hospital documentation promising to pay for the treatment due to my inability to sign the documentation. I further agree to release, waive, discharge, covenant not to sue, and agree to hold harmless for any and all purposes, RELEASEES from any and all liabilities, claims, demands, injuries (including death), or damages, including court costs and attorney’s fees and expenses, that may be sustained by me while receiving medical care or in deciding to seek medical care, including while traveling to and from a medical care facility, including injuries sustained as a result of the sole, joint, or concurrent negligence, negligence per se, statutory fault, or strict liability of RELEASEES. I understand this waiver does not apply to injuries caused by intentional or grossly negligent conduct.
VOLUNTARY SIGNATURE. In signing this agreement I acknowledge and represent that I have read it, understand it, and sign it voluntarily as my own free act and deed; sponsor has not made and I have not relied on any oral representations, statements, or inducements apart from the terms contained in this agreement. I execute this document for full, adequate, and complete consideration fully intending to be bound by the same, now and in the future. For students engaging in extracurricular activities: I understand I can choose not to sign this document and free myself from its terms and the associated risks of the activity by simply not participating in the activity and choosing some other activity available to me that has a lower level of risk to me. I further understand this is a voluntary, extracurricular activity; therefore it is not required for me to obtain college credits and not participating in this activity will in no way hinder my ability to obtain a degree from the university. For students going on fieldtrips or other class-related activities: I understand participation in this class/fieldtrip/activity is not mandatory and I will not be penalized for failing to participate in this activity because an alternative activity exists for which I can receive like credit. While I understand alternative activities are available to me that do not have the risks associated with this activity I still desire to voluntarily engage in this activity.

SIGNING THIS DOCUMENT INVOLVES THE WAIVER OF VALUABLE LEGAL RIGHTS. CONSULT YOUR ATTORNEY BEFORE SIGNING THIS DOCUMENT.

☐ By placing an "X" this box I agree to the terms of this agreement.

SIGNED this ___ day of ______________, 20___

Printed Name

Participant’s Date of Birth

Parent or Legal Guardian Signature
(If Participant is under 18 years old)

Parent or Legal Guardian Printed Name
(If Participant is under 18 years old)

INSTRUCTIONS: (1) The document should be printed in a font size no smaller than 10-point type. This is 10-point type. This is 12-point type. (2) The formatting/font style (bolded, underlined, and italicized) in paragraph nos. 1, 2, 5 & 6 should not be altered.

TAMUS-OGC-Approved 08/29/2006
Section 3.0

Diver Status
3.0 DIVER STATUS
An approved TAMUCC diver status is required by all persons diving under the auspices of TAMUCC. Formal application (Appendix 2.A) will be made when a diver requests consideration for a new diver status. This form will be approved by the DCB and signed and dated by the DSO at time of award.

NOTE: Submission of documents and participation in aptitude examinations does not automatically result in certification. The applicant must convince the DCB and DSO that they are sufficiently skilled and proficient to be certified. This skill will be acknowledged by the approval of the DCB and DSO. Applicants who do not possess the necessary judgment, under diving conditions, for the safety of themselves and others may be denied organizational member scientific diving privileges.

3.1 CLASSIFICATION

3.1.1 Scientific Diver-in-Training (SDIT)
This permit status will be granted to diver applicants upon completion of requirements listed in Section 2.0.

3.1.2 Scientific Diver Status (SD)
To participate in the scientific dive program as a SD, one will show an aquatic ability sufficient to perform job duties the title may demand in both confined and open-water scenarios. This is a permit to dive as authorized by and under the auspices of TAMUCC pursuant to the provisions of this standard, and is only usable while current and for the purpose intended.

3.1.2.1 Certification Process
An applicant for SD status will successfully meet the following criteria:

(a) Hold a current SDIT permit (Section 3.1.1) signifying that a diver has met the items outlined in Section 2.0.
(b) Make formal application for Scientific Diving Status to the DSO (Appendix 2.A).
(c) Complete a minimum of 100 hours of theoretical training, knowledge development, Practical Training and Skill Development. Theoretical aspects will include principles and activities appropriate to the intended area of scientific study.
(d) Theoretical Training/Knowledge Development
(1) Required topics (include, but are not limited to):
   (i) Diving emergency care training, including first aid, CPR, oxygen administration, recognition of decompression sickness and arterial gas embolism, accident management, and field neurological exams.
   (ii) Dive rescue.
   (iii) Dive physics.
   (iv) Dive physiology.
   (v) Dive environments.
   (vi) Decompression theory and application.
   (vii) OSHA and other applicable governmental diving regulations.
   (viii) AAUS scientific diving regulations and history as it pertains to scientific dive planning and coordination with other agencies.
   (ix) Scientific method.
   (x) Data gathering techniques specific to area of study including but not limited to transect sampling, transecting, mapping, coring, photography, archaeology, tagging, collecting, animal handling and identification, behavior and ecology, site selection, location and re-location, and specialized training for
equipment incorporation into the prescribed dive operation.

(x) Hazardous materials training with topics on high-pressure cylinders, chemical hygiene, and laboratory safety.

(2) Suggested topics (included, but not limited to):

(i) Surface-supplied and open circuit diving.

(ii) Small boat operation.

(iii) Closed and semi-closed circuit re-breathers.

(iv) Use of air-alternative gas technologies, e.g. NITROX and mixed-gas (Section 5.4).

(v) Specialized diving environments and conditions, e.g. blue water, zero visibility, decompression, overhead, night diving, cold water diving, polluted water, Aquarium diving, potential entanglement, diving in strong current, live boating, kelp Diving, saturation diving, etc.

(vi) Specialized diving equipment such as dry suits, full-face masks, and communications.

(e) Practical Training/Skill Development

(1) Confined Water Evaluation: The applicant will demonstrate in a manner acceptable to the DSO or Instructor, the ability to perform the following in a swimming pool or sheltered water:

(i) Enter the water with full equipment.

(ii) Clear face mask.

(iii) Demonstrate proficiency in buddy breathing and the use of an alternate air source with and without a mask.

(iv) Demonstrate the ability to alternate snorkel and scuba while swimming.

(v) Demonstrate an understanding of underwater signs and signals.

(vi) Demonstrate simulated in-water mouth-to-mouth resuscitation.

(vii) Rescue and transport, as a diver, a passive simulated victim of an accident.

(viii) Demonstrate the ability to remove and replace equipment while submerged.

(ix) Demonstrate a level of comfort in the water acceptable to the instructor.

(2) Open-water Evaluation: The Applicant will satisfy the DSO or instructor of their ability to perform the following in an open-water environment:

(i) Surface dive to a depth of about 10 feet (4.5 m) without scuba.

(ii) Demonstrate ability to clear mask and regulator while submerged.

(iii) Demonstrate proficiency in air sharing as both donor and receiver.

(iv) Enter and leave the surf wearing full scuba equipment.

(v) Leave and board a diving vessel while wearing full scuba equipment.

(vi) Snorkel 400 yards (364 m) with breathing apparatus in position, but not breathing from the scuba unit.
(vii) Compute their own surface gas consumption (SAC) rate in cubic feet/minute for each training dive.

(viii) Demonstrate the ability to achieve and maintain neutral buoyancy at the surface and below the surface.

(ix) Demonstrate techniques of self-rescue and buddy assistance.

(x) Demonstrate knowledge and ability to make a simulated emergency swimming ascent from a depth of 20 feet.

(xi) Navigate underwater

(xii) Demonstrate knowledge and ability to plan and execute a dive.

(xiii) Demonstrate the ability to maneuver efficiently in the environment, at and below the surface.

(xiv) Showing judgment consistent with safe diving practices will be demonstrated at all times, both above and below water.

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

(f) Examinations

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

(i) Function, care, and use of diving equipment.

(ii) Physics and physiology of diving.

(iii) Diving regulations and precautions.

(iv) Near-shore currents and waves.

(v) Dangerous marine animals.

(vi) Emergency procedures, including buoyant ascent and ascent by air sharing.

(vii) Currently accepted decompression procedures.

(viii) Demonstrate the proper use of dive tables.

(ix) Underwater communications.

(x) Aspects of freshwater and altitude diving operations.

(xi) Diving hazards.

(xii) Cause, symptoms, and prevention of the following: near drowning, air embolism, carbon dioxide excess, squeezes, oxygen poisoning, nitrogen narcosis, exhaustion and panic, respiratory fatigue, motion sickness, decompression sickness, hypothermia, hypoxia/anoxia.

(xiii) Suggested topics (3.1.2.1(d)(2)) at the DSO’s discretion.

(2) Equipment: the trainee will be subject to examination/review of:

(i) Personal diving equipment.

(ii) Task specific equipment.
3.1.3 Working Diver Status (WD)
To participate as a WD under the auspices of TAMUCC, one will show an aquatic ability sufficient to perform job duties the title may demand in both confined and open-water scenarios. This is a permit to dive as authorized by and under the auspices of TAMUCC pursuant to the provisions of this standard, and is only usable while current and for the purpose intended.

3.1.3.1 Certification Process
An applicant for WD status will successfully:

(a) Hold a current SD permit signifying that a diver has met all of the criteria outlined in Section 3.1.2.
(b) Make formal application for Working Diving Status to the DSO (Appendix 2.A).
(c) Swim Evaluation
   (1) General
      (i) All WD candidates will successfully pass the swim evaluation prior to undergoing further certification training.
      (ii) All swim evaluation skills will be demonstrated satisfactorily in a single session. If an applicant is unable to complete the evaluation, a reevaluation can be scheduled no sooner than one month from the date of an incomplete evaluation.
   (2) Working diver swim evaluation requirements include:
      (i) Swim 550 yards (503 m) on the surface without stopping in 15 minutes or less.
      (ii) Swim 200 yards (183 m) using mask, fins, and snorkel.
      (iii) Swim 25 yards (23 m) underwater without surfacing and without pushing off from the wall of the pool.
      (iv) Tread water for 30 minutes without any flotation aids.
      (v) Without swimming aids, transport another person of equal size a distance of 25 yards (23 m) in the water.
(d) Have on file, an annual statement from a licensed physician attesting to applicant’s fitness for diving (Section 8.0).
(e) Complete training on specified diving procedures and protocols as required (i.e. specific training on use of tools and equipment commonly employed in the commercial diving field).

3.1.4 Temporary Diver Permit
Issuance of this permit constitutes a waiver of the requirements outlined in Section 3.0 and will only follow a demonstration of the required proficiency in diving. It is only valid for a limited time, as determined by the DCB or the DSO. This permit is not to be construed as a mechanism to circumvent existing standards set forth in this standard. The DSO may waive requirements of this section if the person in question has demonstrated proficiency in diving and can contribute measurably to a planned dive. The applicant will:

(a) Make formal application for Scientific Diving Status to the DSO (Appendix 2.A) or in a case of reciprocity, a completed and signed Appendix 1.A.
(b) Provide a statement from a licensed physician, attesting to the applicant’s fitness for diving (Appendix 8.A-D) or in a case of reciprocity, a completed and signed Appendix 1.A.
(c) Complete and sign a Release of Liability (Appendix 2.B).
(d) Possess and provide copies of their internationally recognized dive certificates.
3.2 Depth Certifications

3.2.1 General

(a) TAMUCC divers may progress to the next depth level after successfully completing the required dives for the next level. Under these circumstances, the diver may exceed their depth limit. Dives will be planned and executed under close supervision of a diver certified to this depth, with the knowledge and permission of the DSO. In some circumstances, the DSO may make depth status allowance based on a diver’s past dive record prior to entering the TAMUCC dive program.

(b) A diver’s depth certification will expire six months from the date of the last logged dive to the certification depth. Status will be re-awarded after making a supervised successful dive to certified depth with the DSO or designee.

(c) Once the required certification requirements are met, a diver whose depth certification has lapsed due to lack of activity may be re-qualified by making a dive to that depth under the supervision of the DSO or designee who is actively certified to dive at this depth.

(d) A diver’s Maximum Operating Depth (MOD) per a given gas mixture (Section 5.4) will be determined by a working PPO2 of ≤1.4, a resting PPO2 of ≤1.6, and an Equivalent Air Depth/Equivalent Narcosis Depth (EAD/END) of ≤130 feet.

(e) Dives requiring in-water decompression require pre-approval by the TAMUCC DCB.

3.2.2 Depth Qualifications

(a) 30-foot Depth Certification
Thirty feet is the initial, permit level and will be approved upon the successful completion of training listed in Section 2.0 and 3.1.1.

(b) 60-foot Depth Certification
A diver holding a 30-foot depth certificate may be certified to a depth of 60 feet after successfully completing 12 dives to depths between 30 to 60 feet.

(c) 100-foot Depth Certification
A diver holding a 60-foot depth certificate may be certified to a depth of 100 feet after successfully completing, four dives to depths between 60 to 100 feet. The diver seeking this depth certification will also demonstrate competency in decompression theory, tables, and procedures.

(d) 130-foot Depth Certification
A diver holding a 100-foot depth certificate may be certified to a depth of 130 feet after successfully completing, four dives to depths between 100 to 130 feet. The diver seeking this depth certification will also demonstrate competency in decompression theory, tables, procedures, and special problems of deep diving, and special safety requirements.

(e) 150-foot Depth Certification
A diver holding a 130-foot depth certificate may be certified to a depth of 150 feet after successfully completing, four dives to depths between 130 to 150 feet. The diver seeking this depth certification will also demonstrate knowledge of the special problems of deep diving, and special safety requirements.

(f) 190-foot Depth Certification
A diver holding a 150-foot depth certificate may be certified to a depth of 190 feet after successfully completing, four dives to depths between 150 to 190 feet. The diver seeking this depth certification will also demonstrate knowledge of the special problems of deep diving, and special safety requirements.

NOTE: Diving on air is not permitted beyond a depth of 190 feet.
3.3 DIVER STATUS MAINTENANCE

To maintain certification, a diver will:

(a) Keep a current medical examination.
   1) All divers will pass an initial medical examination, and thereafter be examined at
      specified intervals as stipulated in Section 8.2.
   2) After any major illness or injury, as described in Section 8.2(c), a diver will receive
      clearance to return to diving, from a physician, before resuming dive activities

(b) Log a minimum of 12 dives during any 12-month period.

(c) Log a dive to certification depth during each 6-month period. Divers certified to depths
    150 feet and greater may satisfy these requirements with dives to 130 feet or over.

(d) Maintain current First Aid, Adult CPR, Oxygen Provider, and other certifications, as
    applicable.

(e) Attend a biennial Dive Accident Management session.
   1) General.
      (i) The Dive Accident Management session will be documented by the
          DSO, or designee, and a record of attendance and participation will be
          kept in each diver’s file.
      (ii) Failure to participate in a biennial Dive Accident Management session
           will result in suspension of diving privileges until completed.

   2) Requirements
      (i) Dive rescue skills will include, but not be limited to:
          • A mask, fin, and snorkel swim of 25 yards (22 m).
          • The retrieval of an unconscious diver from 10 feet.
          • Transportation of an unconscious diver a distance of 25 yards.
          • Removal of an unconscious diver from the water via
            backboard.
          • Recognition and treatment of simulated diving injuries
            demonstrating proper techniques when:
             Performing a 5-minute neurological examination
             Administering oxygen in a diving emergency.
             Employing the use of an AED.
             Assessing a possible spine injury and implementing
              possible backboard-based immobilization.

3.4 REVOCATION OF CERTIFICATION

Certification may be revoked and the diver’s status inactivated by the DCB and/or the DSO for:

(a) Failure to comply with any regulation contained herein.
(b) Noncompliance with any pertinent regulations or laws.
(c) Willful disobedience of verbal requests by those in charge of diving or vessel
    operations.

The diver will be informed of the reasons for revocation in writing and will be given an opportunity
to present their case, in writing, to the DCB for consideration and/or re-certification. All written
documents will become part of the diver’s file.

3.5 RE-CERTIFICATION

If a diver’s certificate is expired or revoked, they will be re-certified after complying with such
conditions as the DSO or DCB may impose. The diver will be given an opportunity to present
their case to the DCB before conditions for re-certification are stipulated.
APPENDIX 3.A

SCIENTIFIC DIVER-IN-TRAINING/SCIENTIFIC DIVER SWIM EVALUATION

Applicants for Scientific/Working Diver status will demonstrate proficiency in the following skills to the Dive Safety Officer or designee:

__________________________________________  ________________________________
Applicant (please print)                  Date (month/day/year)

Swim and Skin-Diving Skill Tests

_____ Swim underwater 25 yards (23 m) without surfacing and without swimming aids.

_____ Swim 400 yards (366 m) in 12 minutes or less, without swimming aids, using any stroke/combination of strokes

_____ Without swimming aids, transport another person of equal size a distance of 25 yards (23 m) in the water.

_____ Tread water for 10 minutes, or two minutes without the use of hands, without swimming aids.
APPENDIX 3.B
WORKING DIVER SWIM EVALUATION

Applicants for Scientific/Working Diver status will demonstrate proficiency in the following skills to the Dive Safety Officer or designee:

_________________________________  __________________________
Applicant (please print)                Date (month/day/year)

Swimming Skill Tests

______ Swim 25 yards (23 m) underwater without surfacing and without pushing off from the wall of the pool.

______ Swim 550 yards (503 m) in 15 minutes or less, without swimming aids, using any stroke/combination of strokes

______ Swim 200 yards (183 m) using mask, fins, and snorkel.

______ Without swimming aids, transport another person of equal size a distance of 25 yards (23 m) in the water.

______ Tread water for 30 minutes without any flotation aids.
Section 4.0

General Operation Procedures
4.0 **GENERAL OPERATION PROCEDURES**

The following are minimum guidelines and although modifications may be necessary, each will be duly considered in preparation for a dive operation.

4.1 **EMERGENCY AID**

(a) TAMUCC will maintain a list of available sources of emergency aid, equipment, and professional assistance and contact information, e.g. phone numbers and call signs, and instructions for establishing contact with them (Appendix 4.B).

(b) This list will be made available at the University, field offices, and dive locations to fulfill the outlined emergency response plan.

(c) The list will include necessary information to obtain the following types of emergency aid as deemed appropriate for the type of diving activity being conducted:

1) Recompression Chamber.
2) Hospital or medical treatment facility.
3) Air and/or ground transportation.
4) On-call physician.
5) Coast Guard and/or National Coordination Rescue Centers.

(d) Two-way communications will be available and accessible at any dive site in order to employ the required emergency services.

4.2 **FIRST AID**

Supplies at the dive site will include:

(a) A First Aid kit and handbook, in a clearly marked container, and appropriate for the type of operation being conducted (Section 7.2.3(a)).

(b) An Emergency Oxygen supply with an adequate emergency supply and delivery system consisting of a bag-type resuscitator (or equivalent device) (Section 7.2.3(b)).

(c) Automated External Defibrillator (AED)

(d) Backboard, restraint harness, and cervical immobilization collar.

4.3 **TEAM BRIEFING**

(a) Prior to any underwater operation, dive team members will be briefed on:

1) Tasks to be undertaken.
2) Safety procedures for the diving mode.
3) Hazards or environmental conditions that may affect safety of the dive operation.
4) Modifications to operating procedures necessitated by a specific diving operation.

(b) Prior to making individual assignments the Designated Person in Charge/Lead will 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.

4.4 **TERMINATION OF DIVE**

The working interval of a dive will be terminated when:

(a) Directed by the Designated Person in Charge/Lead.

(b) A diver requests termination.

(c) A diver fails to respond correctly to communications or signals from a team member.

(d) Communications are lost and cannot be quickly re-established between divers or a diver and the dive location.

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

4.5 **POST DIVE PROCEDURES**

(a) It is the Designated Person in Charge/Lead’s responsibility to:

1) Check the physical condition of all divers.
2) Instruct the diver(s) to report any physical problems or adverse physiological effects including symptoms of decompression sickness.
3) Advise diver(s) of the location of the nearest working decompression chamber.
4) Alert the diver(s) to the potential hazards of flying and increased altitudes in excess of 800 feet after diving, except in an emergency.
5) Instruct the diver(s) to remain awake and in dive vicinity for at least one hour.
6) Instruct the diver(s) to make reasonable accommodations to remain within two hours travel of a decompression chamber for an additional five hours, after making a dive:
   (i) Outside of the no-decompression limits.
   (ii) Deeper than 100 feet.
   (iii) Using an air-alternative gas as a breathing mixture.

(b) It is the diver's responsibility to:
1) Report any physical problems or adverse physiological effects including symptoms of decompression sickness.
2) Report any equipment malfunctions.
3) Remain awake and in the dive vicinity for at least one hour.
4) Make reasonable accommodations to remain within two hours travel of a decompression chamber for an additional five hours, after making a dive:
   (i) Outside of the no-decompression limits.
   (ii) Deeper than 100 feet.
   (iii) Using mixed-gas as a breathing mixture.

4.6 HAZARDS TO UNDERWATER OPERATIONS
(a) Notice will be provided for a planned underwater operation, including the start and finish times, to those in the vicinity whose activities may interfere with or pose a hazard to personnel engaged in the operation. These activities include:
   1) Vessel movement, vehicular traffic, etc.
   2) Overhead crane/gantry operations.
   3) Pedestrian traffic.
(b) Diving operations will not take place wherever hazardous activities or conditions in the vicinity pose a safety hazard to the diver(s) or impair support personnel from safely carrying out their work tasks.

4.7 UNDERWATER HAZARDOUS CONDITIONS
As part of the Dive Plan, considerations will include, but not be limited to:
(a) Potential fouling or entrapment of divers.
(b) Differential pressure hazards.
(c) Lockout/Tag-out hazardous energy situations, e.g. propellers, pumps, vessels, or a mechanical apparatus that the inadvertent operation would be hazardous to the diver(s).
(d) Diving in contaminated liquid, either, chemical, microbiological, or thermal.
(e) Limited access or penetration situations when the diver(s) enter a pipe, tunnel, wreck, or similarly enclosed or confining structure.
(f) Marine life.
(g) Currents and/or tidal conditions.

4.8 TEMPORARY IMPAIRMENT OR CONDITION
TAMUCC will not:
(a) Require a diver to be exposed to hyperbaric conditions against their will, except when necessary to complete decompression or treatment procedures.
(b) Permit a diver to dive or be otherwise exposed to hyperbaric conditions for the duration of any temporary physical impairment or condition that is known and is likely to adversely affect the safety or health of a dive team member. This includes but is not limited to colds, alcoholic intoxication or aftereffects, fatigue, or emotional distress. The diver will be consulted before making such a determination.
4.9 **INSPECTION OF SYSTEMS, EQUIPMENT, AND TOOLS**

(a) Before diving or underwater operations commence, personnel will confirm all systems, equipment, and tools to be used are in working order, appropriate for the tasks and in compliance with the Equipment and Systems Section, 7.0.

1) To ensure the highest standard of safety, checklists will be used to confirm that the systems, equipment, and tools are in safe working order.

(b) The breathing gas supply system, reserve breathing gas supplies, masks, helmets, thermal protection, etc., will all be inspected daily and monitored throughout the operations by designated persons to ensure they are functioning properly.

(c) Each person engaged as a diver will perform a complete functional check of their dive equipment in the presence of the Designated Person in Charge/Lead to ensure that the equipment is in proper working order and is suitable for the type of diving operation.

4.10 **WATER ENTRY AND EXIT**

A means capable of supporting a diver will be provided for entering and exiting the water. If a ladder is used, it will extend a minimum of three feet below the water surface. The means will also be adequate to facilitate the removal of an injured diver from the water.

4.11 **THERMAL EXPOSURES**

Precautions will be taken to protect divers and topside personnel from adverse thermal exposure and maintain proper thermal balance while engaged in operations.

4.12 **WARNING DISPLAY**

When diving from a surface that can support marine traffic, an appropriate warning display will be exhibited near the work site so that it has all-around visibility. This may include, but is not limited to shapes, lights, flags, or placards. A rigid replica of the blue and white, international code flag “A” (indicating working dive) is preferred. A red and white “Recreational” flag can be flown when the “A” is not available. Flags at least one-half meter in height will be displayed at the dive location allowing all-round visibility. Flags will be illuminated during night diving operations.

4.13 **COMMUNICATIONS**

There will be properly functioning two-way audio-communications between the diver(s) and the dive site except as permitted by Section 5.2.2 “SCUBA”, in “Specific Dive Operation Procedures”.

4.14 **DECOMPRESSION TABLES**

Appropriate no-decompression, repetitive, and decompression tables will be at the dive location.

4.15 **DIVE PROFILES**

A depth-time profile, including when appropriate, any breathing gas changes, will be maintained for each diver during the dive, including decompression.

4.16 **HAND-HELD POWER TOOLS AND EQUIPMENT**

Hand-held electrical tools and equipment will:

(a) Be off before being placed into or retrieved from the water.

(b) Not be turned on until requested by the diver.

4.17 **EMERGENCIES AND DEVIATIONS FROM REGULATIONS**

In an emergency requiring the saving of personnel, TAMUCC divers may act in variance with the operating procedures and recommendations established in this standard. A written report of such actions will be submitted to the DCB explaining the circumstances and justifications.

4.18 **FLYING AND INCREASED ALTITUDES AFTER DIVING**

(a) The diver(s) will be made aware of the potential hazards of flying and increased altitudes in excess of 800 feet after diving, except in an emergency.

(b) It is advised that the diver(s) adhere to the “flying after diving recommendations” of the system being used or provide a minimum surface interval of 12 hours for single no-decompression dives; 18 hours following multiple days of diving, and; a minimum of 24 hours when dives required decompression before ascending to altitudes in excess of 800 feet.
4.19 QUALIFICATIONS OF DIVE TEAM

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

(b) If a period of more than six months has elapsed since the last similar dive, a series of progressive workup dives to return the diver(s) to proficiency status prior to the start of project diving operations are recommended.

4.19.1 General Requirements

Each dive team member will have experience or training in:

(a) The use of tools and systems relevant to assigned tasks.
(b) The techniques of the assigned diving mode.
(c) The dive operations and emergency procedures.
(d) First aid, CPR, and the administration of oxygen in a dive related emergency.
(e) Physics and physiology if exposed to or controlling the exposure of others to hyperbaric conditions.

4.19.2 General Responsibilities

(a) Refusal to dive:

(1) The final decision to dive is the diver's. A diver may refuse to dive, without fear of reprisal, if they feel it is unsafe for them to dive.
(2) Safety - ultimate responsibility for safety rests with the individual diver. It is the diver's responsibility and duty to refuse to dive if, in their judgment, conditions are unsafe or unfavorable, or if they will be violating the precepts of their training or the regulations of this standard.

(b) Termination of the dive:

(1) It is the responsibility of the diver to terminate the dive, without fear or penalty, whenever they feel it is unsafe to continue the dive, unless it compromises the safety of another diver already in the water.
(2) The dive will be terminated with sufficient gas allowing the diver to safely surface, or to reach an additional gas source at the decompression station.

4.19.3 Dive Team Assignments

Each dive team member will be assigned tasks in accordance with their experience or training. Limited additional tasks may be assigned to an employee undergoing training provided these tasks are performed under the direct supervision of an experienced dive team member.

(a) Designated Person in Charge (DPIC):

The DPIC is in charge of the planning and execution of the dive operation, including the responsibility for the safety and health of the dive team. In carrying out these responsibilities, duties will include, but not be limited to:

(1) Being fully cognizant of all relevant governmental regulatory agency and member association regulations that apply to the dive operation and dive mode employed.
(2) Ensure all the rules and regulations outlined in TAMUCC Diving Standards for Underwater Operations are followed.
(3) Coordination with other known activities in the vicinity that are likely to interfere with dive operations.
(4) While on duty be in immediate control and available to implement emergency procedures.
(5) Ensuring all dive team members possess current certifications and are qualified for the type of diving operation.
(6) At all times perform duties with an ability to manage all aspects of the dive location, properly direct dive team members in the performance of their duties, while remaining ready to respond to emergency conditions.
In an emergency circumstance, the DPIC may enter the water if it will not interfere with continued topside supervision.

(7) Ensure dive operations are carried out from a safe and suitable location on the surface.

(8) Develop, modify, and produce pre and post-dive checklists for dive operations.

(9) Develop and implement emergency/contingency procedures.

(10) Be aware of the procedures to obtain medical support in the event of an accident, diving and non-diving. Ensure two-way communications are available at dive location to obtain emergency assistance.

(11) Perform a dive plan for each dive operation undertaken.

(12) Establish dive plans to ensure sufficient breathing mixtures, supplies, and proper equipment is available for safe and timely completion of job tasks.

(13) Assign duties to members of the dive team and personally direct them throughout dive operations.

(14) Personally verify all dive team members are qualified and physically able to perform tasks assigned. The DPIC will assess the physical condition of the divers prior to each dive to determine if any physical impairment is present which would be detrimental to their health and safety under hyperbaric conditions.

(15) Ensure diving and safety equipment designated for use is:

   (i) Suitable for the planned operation.
   (ii) Sufficient for the requirements of the diving mode used.
   (iii) Inspected prior to each dive and is in good working order.

(16) Ensure all relevant operating instructions, manuals, decompression tables, and regulatory publications are available at the dive location and are maintained to reflect current changes and/or developments.

(17) Ensure detailed briefing of dive team and support personnel including:

   (i) Tasks to be undertaken
   (ii) Possible hazards and conditions
   (iii) Modifications to diving or emergency procedures necessitated by the specific dive operation.
   (iv) Suspension of dive operation if conditions are not safe.

(18) Make modifications to standards or safety procedures as necessitated by specific dive operations.

(19) Maintain an Operational Dive Log (Section 6.1.1 and Appendix 6.A) at the dive location for each diver during the dive.

(20) Ensure divers are properly tended while in the water when necessary.

(21) Ensure the dive is terminated when:

   (i) Diver requests termination.
   (ii) Diver fails to respond or communication is lost between the diver and dive team members at the dive site.
   (iii) Diver begins to use their reserve breathing gas supply.
   (iv) Weather or site conditions are degraded to the extent that diver’s safety may be compromised.

(22) Ensure after every dive:

   (i) The physical condition and well-being of the diver is checked by visual observation and verbal questioning.
   (ii) The diver is instructed to report any problems or symptoms of pressure related injuries.
   (iii) The diver is advised of the location of the nearest operating decompression chamber.
(iv) The diver is acquainted with the potential hazards of flying after diving or traveling to altitudes in excess of 800ft, except in the case of an emergency.

(v) Operational dive log information is recorded (Section 6.1.2 and Appendix 6.B).

(23) Ensure after any treatment or dive the diver is instructed to remain awake and in the dive vicinity for at least one hour.

(24) Instructing the diver(s) to make reasonable accommodations to remain within two hours travel of a decompression chamber for an additional five hours, after making a dive:
   (i) Outside the no-decompression limits.
   (ii) Deeper than 100 feet.
   (iii) Using mixed-gas as a breathing mixture.

(25) Reporting to the DSO and DCB any physical problems or adverse physiological effects including symptoms of pressure-related injuries, accidents, and incidents, involving TAMUCC personnel.

(26) Maintain and submit reports required by TAMUCC to the DSO and DCB for forwarding to appropriate governmental agencies and member organizations.

(b) Lead:
   (1) A dive team member recognized by the DPIC and designated to “lead” at the dive site. The Lead is responsible for all aspects of the dive operation that affect the safety and health of dive team members.
   (2) The Lead will have experience and training in the conduct of the assigned dive operation.

(c) Diver:
   The Diver is assigned by the DPIC/Lead to perform specific tasks in the water and topside. Divers will be at least 18 years of age, medically certified fit to dive, have knowledge of diving theory and practice, a full understanding of the equipment in use, and the tasks assigned. Each Diver will:
   (1) Accomplish all tasks assigned by the DPIC/Lead.
   (2) In the event a Diver is assigned a task which they do not consider themselves competent by training and/or experience, the diver will immediately inform either the DPIC/Lead.
   (3) Read, understand, and comply with all TAMUCC policies and applicable governmental regulations as they relate to their qualifications or performance while engaging in dive operations.
   (4) Maintain a level of fitness appropriate for the tasks to be encountered.
   (5) Will immediately return to the surface when instructed to so by the DPIC/Lead.
   (6) Ensure deepest depth attained is noted before ascent (i.e. SCUBA).
   (7) Act as a Standby Diver when directed to so and will:
      (i) Be dressed sufficiently to allow near immediate entry into the water and to stay at depth, as long a circumstance require.
      (ii) Remain at their station throughout the entire dive.
      (iii) Remain abreast of events of the dive.
      (iv) Not be assigned any tasks that may interfere with their duties as a Standby Diver while a diver is in the water.
   (8) Comply with regulations or instructions concerning the use, maintenance, repair, and testing of all diving equipment provided for the operation.
   (9) Report any recent medical treatment or illness so that a proper determination can be made concerning their fitness and/or ability to dive.
(10) Immediately report all symptoms or suspected symptoms of diving related injuries to the DPIC/Lead as early and accurately as possible.

(11) Report to the DPIC/Lead any defect or malfunction of the diving equipment provided for the dive operation.

(12) Follow safe dive practices at all times during the dive operation whether on deck or in the water. Bring to the attention of the DPIC/Lead any questionable items. Be alert for the safety of others as well as themselves.

(13) Assist in the proper training of new personnel.

(14) Make reasonable accommodations to remain within two hours travel of a decompression chamber for an additional five hours, after dives:

(i) Outside the no-decompression limits.
(ii) Deeper than 100 feet.
(iii) Using mixed-gas as a breathing mixture.

(15) Know and observe the rules for flying after diving or increased altitudes in excess of 800 feet, except in the case of an emergency.

(16) Ensure that their diving equipment has been maintained, prepared, and tested before each dive.

(17) Maintain a logbook of all TAMUCC related dives.

(d) Tender:

The Tender will be assigned by the DPIC/Lead to tend the diver(s). The tender will devote their full time and attention to tending the diver(s) they are assigned to from the preparation of the dive until its completion.

The Tender will:

(1) Assist the diver(s) in dressing and undressing.
(2) Confirm that the diver’s equipment is functioning properly and inform the DPIC/Lead when a diver is ready.
(3) Tend the diver umbilical’s staying aware of the diver’s depths and location at all times.
(4) Set up and operate the equipment as directed by the DPIC/Lead.
(5) In the event they are assigned a task they do not consider themselves qualified to undertake, by either training and/or experience, they will immediately inform the DPIC/Lead.
(6) Assist in topside work as required or directed, providing tending duties are not affected.
(7) Be alert for and immediately report conditions that may be hazardous or unsafe.

(e) Standby Diver

The Standby Diver is the individual possessing the required training and experience to enter the water at the diving station in order to render prompt and immediate assistance to a stricken diver.

The Standby Diver will:

(1) Be capable and qualified to carry out all of the duties and responsibilities of the diver as set forth above.
(2) Perform a surface check of equipment, prior to commencement of the dive, to ensure proper breathing gas supply, function, and effective communications, and will be maintained in that condition until the completion of the dive.
(3) Remain in the immediate vicinity of the dive site, and be suitably prepared to enter the water when directed by the DPIC/Lead.
(4) Will be a line-tended individual. Line-tending is not requisite when standby divers are “buddied”, e.g. during scuba operations.
4.20 PERSONNEL REQUIREMENTS
The number of diving personnel required for a dive operation is never less than three (3); however, planning will take into consideration not only the direct requirements of the work to be performed, but also additional factors either known or suspected that may lead to complications during the conduct of the intended operation. Merely because a dive operation comprised of three persons may be adequate during one operation does not guarantee the same number will be sufficient to accommodate the requirements of another.

4.21 DIVE PLAN
Before conducting any dive operations under the auspice of TAMUCC, a job assessment will be formulated in the form of a Dive Plan (Appendix 4.A).
NOTE: When preparing a Dive Plan, it is preferred Appendix 4.A be copied and used as is, but may be modified to suit the individual operational requirements.
The primary purpose of the Dive Plan is to provide a dive plan in the form of a written document.

(a) Each Dive Plan will:
   1) Be written by the DPIC.
   2) Be submitted to the DSO or DCB for review and approval.
   3) Be reviewed and updated as warranted, i.e. staff safety concerns are conveyed, new equipment, procedures, or an injury/accident has occurred.
   4) Have an approved copy at the dive location.

(b) Each Dive Plan will consist of:
   1) Project Information that will include, when applicable:
      (i) Project.
      (ii) Dive type.
      (iii) Objective.
      (iv) Proposed dive site(s) and alternatives.
      (v) Proposed work and dive mode.
      (vi) Immediate contact name and number(s).
   2) Diving Participants including:
      (i) Diver’s name.
      (ii) Qualifications.
      (iii) Certificate or certification held.
   3) Site Plan and Orientation specifying:
      (i) Dive location(s).
      (ii) Directions.
   4) Dive Site description providing:
      (i) Conditions.
      (ii) Hazards (above and below water).
      (iii) Estimated depth(s).
      (iv) Topography.
      (v) Visibility.
      (vi) Surf.
      (vii) Boat traffic.
      (viii) Tides.
      (ix) Currents.
      (x) Bottom type/composition.
      (xi) Marine inhabitants.
   5) Weather Outlook/Forecast to include:
      (i) Air and water temperature (surface and bottom).
      (ii) Tides.
      (iii) Seas.
      (iv) Wind speed and direction.
      (v) Skies.
      (vi) Surge.
6) Dive Plan outlining:
   (i) Number of proposed dives.
   (ii) Maximum depth.
   (iii) Bottom time(s).
   (iv) Diving equipment and systems, including thermal protection.
   (v) Breathing gas mixtures and supplies (including reserves).
   (vi) Repetitive dive plans.
   (vii) Decompression status and treatment procedures.
   (viii) Dive boundaries and areas of avoidance.
   (ix) Ascent procedures.
   (x) Signal displays.
   (xi) Surface support and standby diver procedures.
   (xii) Boats to be employed.
   (xiii) Entry/exit procedures.
   (xiv) Buddy checks and procedures.
   (xv) Communications.
   (xvi) Emergency procedures (in-water).

7) Proposed Sequence of Procedures will include:
   (i) Job steps.
   (ii) Listings of potential hazards to the diver(s) such as fouling, entrapment, marine animals, and limited access or penetration situations.
   (iii) Recommended safe procedures and protections.
   (iv) Dive operation personnel assignments and responsibilities that take into consideration the fitness and training of each team member so all dives are planned around the competency of the least experienced diver.

8) Emergency Contact Sheet (Appendix 4.B) with the following contact information:
   (i) Name, contact information, and relationship of person to be contacted for each diver in the event of an emergency.
   (ii) Emergency contact information.

9) Planned available means of transportation.
## TAMUCC DIVE PLAN

**Date Submitted**

**Date Approved**

**Submitted By**

**Approved By**

### General Dive Operations

<table>
<thead>
<tr>
<th>Proposed Date(s) of Dive Operations</th>
<th>Distance from Shore</th>
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<thead>
<tr>
<th>Location of Dive Operations</th>
<th>Number of Divers</th>
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<thead>
<tr>
<th>Dive Platform</th>
<th>Number of Dive Rotations/Day</th>
<th>Number of Dives/Day</th>
<th>Number of Consecutive Dive Days</th>
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<table>
<thead>
<tr>
<th>Depth Range</th>
<th>Average Dive Time (min)</th>
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<th>Dive Mode</th>
<th>SCUBA Surf. Supply</th>
<th>Dive Purpose</th>
<th>Scientific Working</th>
<th>Prof/Training</th>
<th>Dive Planner</th>
<th>Type</th>
<th>Model</th>
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<table>
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<tr>
<th>Diving Gas</th>
<th>Air</th>
<th>Nitrox (% O2)</th>
<th>Trimix (% O2) (% He)</th>
<th>Job Status</th>
<th>On-Duty</th>
<th>Off-Duty w/Univ. Equip.</th>
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</table>

### Environment

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<tr>
<th>Water Column</th>
<th>Nitrox</th>
<th>Altitude</th>
<th>Dry Suit</th>
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</table>

<table>
<thead>
<tr>
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<th>Salt Water</th>
<th>Structure</th>
<th>Trimix</th>
<th>Search/Recovery</th>
<th>Full Face Mask</th>
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<tr>
<th>Job Status</th>
<th>On-Duty</th>
<th>Off-Duty w/Univ. Equip.</th>
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### Possible Hazards

**Certain hazards are present on all dives (AGE, DCS). List hazards unique to this operation**

<table>
<thead>
<tr>
<th>Physical</th>
<th>Biological</th>
<th>Manmade</th>
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<tr>
<th>Current</th>
<th>Sharks</th>
<th>Boat Traffic</th>
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<tbody>
<tr>
<td>Fog</td>
<td>Spiny Organisms</td>
<td>Overhead Cranes</td>
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<tr>
<td>Ice</td>
<td>Marine Mammals</td>
<td>Gantry</td>
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<tr>
<td>Low Visibility</td>
<td>Stinging Organisms</td>
<td>Construction</td>
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<tr>
<td>Pollution</td>
<td>Other:</td>
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<td>Other:</td>
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### Additional Comments:

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<tr>
<th>Tools/Equipment</th>
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<table>
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<tr>
<th>Air Compressor: University property?</th>
<th>If no, list owner.</th>
<th>Cylinder Specifics</th>
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<table>
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<tr>
<th>Cylinders: University property?</th>
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<th>Size</th>
<th>Type</th>
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<th>Cylinder Filling/Gas Mixing: University based?</th>
<th>If no, list owner.</th>
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<tr>
<th>Air Tools: (lift bags, vacuum, drills, etc.) will be used for this project.</th>
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<tr>
<th>O2 Kit at Site</th>
<th>AED at Site</th>
<th>First Aid Kit at Site</th>
<th>Dive Flag at Site</th>
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<th>Diver Recall Device</th>
<th>Type?</th>
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<th>Diving Equipment Request:</th>
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**Personnel**

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<tr>
<th>Name</th>
<th>Institution/Agency</th>
<th>Phone</th>
<th>Assignments</th>
<th>Depth Rating</th>
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<tr>
<td>Chief Scientist</td>
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<tr>
<td>Principle Investigator</td>
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<td></td>
<td></td>
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<tr>
<td>Project Dive Supervisor</td>
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<th>Institution/Agency</th>
<th>Phone</th>
<th>Assignments</th>
<th>Depth Rating</th>
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* NOTE: Visiting divers are also required to produce an AAUS Reciprocity Form from their home Agency/Institution's DSO or have TAMUCC DCB approval required.

**Proposed Work**

Briefly provide details of dive procedures to clarify the items noted above.

**Safety Precautions**

- Emergency Assistance Plan (4.B) Appended
- Prepared By: [Signature]
- Emergency Contact Information (4.C) Appended
- Date: [Date]

- Texas A&M University – Corpus Christi
APPENDIX 4.B
DIVE EMERGENCY ASSISTANCE PLAN

Instructions
Complete a Diving Emergency Assistance Plan (DEAP) for each unique diving location and submit the plan to the TAMUCC DSO or designee with the dive plan of each project or anytime any information on the EAP changes.

General Procedures

A. Make appropriate contact with the victim or rescue as required.
B. Evaluate and establish the victim’s Circulation, Airway, and Breathing (CAB).
   a. If victim has no pulse and is not breathing, begin cardiopulmonary resuscitation (CPR) using AED and oronasal resuscitation mask or bag valve mask, supplemented with oxygen.
   b. If victim is breathing, but unconscious, place in the recovery position and administer oxygen via a non-rebreather type mask.
   c. If victim is awake and alert, place in a position of comfort and administer 100% oxygen via a demand oxygen resuscitator or non-rebreather type mask. If the victim is not nauseated, give clear non-alcoholic/non-caffeinated fluids to drink.
F. If the victim’s condition is life threatening or urgent, call the local Emergency Medical System (EMS) or U.S. Coast Guard (USCG) for transportation to the nearest medical treatment facility.
G. If the victim’s condition is not urgent, contact the Diver’s Alert Network (DAN) for guidance.
H. Use the Accident Management Guides (located in the lid of the 02 kit) to document a neurological exam and dive history information.
I. Gather additional information about the incident and prepare victim for transport.
J. Secure diver’s equipment for inspection. DO NOT DISASSEMBLE EQUIPMENT OR EXHAUST GAS FROM THE SYSTEM. Close the cylinder valve ONLY. Count and record the number of turns required to secure valve. Dive computer may go with diver and EMS.
K. Call and speak to the TAMUCC DSO and the Secondary TAMUCC Emergency Contact person to report the incident. Continue calling until positive contact is made. Speak to a person, do not just leave a message.
L. Complete and submit Incident and Accident Report Form (Appendix 10.A) to TAMUCC DSO for

Primary Emergency Contacts

<table>
<thead>
<tr>
<th>Shore Base Emergency Transportation</th>
<th>At Sea Vessel Emergency Transportation</th>
</tr>
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<tbody>
<tr>
<td>Emergency Medical Service (EMS)</td>
<td>United States Coast Guard (USCG)</td>
</tr>
<tr>
<td>911</td>
<td>Channel 16 on Marine VHF Radio</td>
</tr>
</tbody>
</table>

Divers Alert Network (DAN)
+1-800-446-2671
+1-919-684-9111

TAMUCC Dive Safety Officer
Brett Dodson
Office: 361-825-3086
Cell: 678-938-6380
Email: Brett.Dodson@TAMUCC.edu

Secondary TAMUCC Emergency Contact
### Emergency Contact Information

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<thead>
<tr>
<th>Dock/Marina:</th>
<th>Address:</th>
<th>Phone Number:</th>
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<tr>
<th>Directions:</th>
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<th>Directions:</th>
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<tbody>
<tr>
<td>RCC New Orleans</td>
<td>504-589-6225</td>
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</table>

### Additional Available Means of Transportation:


## Appendices 4.C

### Dive Team Emergency Contact Information

<table>
<thead>
<tr>
<th>Diver:</th>
<th>Emergency Contact:</th>
<th>Relation:</th>
<th>Primary Contact Number:</th>
<th>Secondary Contact Number:</th>
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Emergency Contact Information for Team Members
Section 5.0

Specific Dive Operation Procedures
5.0 **Specific Dive Operation Procedures**

Specific Dive Operation procedures will vary with the dive mode. Prior to mobilization, the completed Dive Plan (Section 4.23) will have determined the dive mode, equipment needs, and staffing requirements.

NOTE: Solo diving is prohibited and all diving shall assure adherence to the buddy system.

5.1 **Breath-Hold Diving**

This section applies to authorized TAMUCC divers who conduct breath-hold dives as part of their official duties.

5.1.1 **Defined**

Breath-hold diving (snorkeling) is defined as a diving mode in which a diver is subjected to a hyperbaric environment, using no self-contained or surface-supplied gas supply.

5.1.2 **Limitations**

Unless specifically authorized by the DCB or DSO, and upon review and approval of a dive plan, 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  
(d) In current greater than 0.5 knots

NOTE: As a rule of thumb, breath-hold dives no deeper than 10-15 feet may be made after compressed gas dives two steps or more below the U.S. Navy no-decompression table limits. Increased caution should be exercised the closer to the NDL’s and/or when depth increase beyond 10-15 feet.

5.1.3 **Personnel Requirements**

(a) Unless specifically authorized by the DCB, each breath-hold diver shall be equipped with:

1. Mask
2. Fins
3. Snorkel
4. A means of obtaining surface flotation/providing positive buoyancy
5. Cutting device

(b) The UDS may also require a buddy snorkeler/breath-hold diver.

5.2 **Scuba Diving**

TAMUCC dive operations employing SCUBA Diving will comply with the following requirements unless otherwise specified.

5.2.1 **Defined**

Self-contained underwater breathing (SCUBA) is defined as a diving mode in which the gas supply is independent of surface support.

5.2.2 **Limitations**

(a) The following are minimum requirements for TAMUCC SCUBA Diving Operations:

1. A diver will be line tended from the surface, or accompanied by another diver (buddy) in the water in continuous contact (visual or tethered) during the dive operation. Buddy system defined:
   
   (i) A single buddy team can consist of two or three divers. A four diver deployment will represent two buddy teams of two.  
   (ii) The buddy system is based upon mutual assistance, especially in an emergency. Dives will be planned around the competency of the least experienced diver and the dive terminated as soon as either team member runs low on breathing gas, normally defined as 500 psi.
(2) During all dives, a Standby Diver will be available while a diver is in the water.

(3) Audio communications are not required for a diver who is accompanied by another diver or who can communicate with the tender on the surface through a safety line using pull signals.

NOTE: Use of line pull signals for a primary communication source is discouraged and alternatives will be considered.

(4) Planned bottom time will not exceed the:
   (i) No-decompression limits appropriate for the gas mixture being used unless pre-approved by the DCB.
   (ii) Gas supply duration of the cylinders. Duration will be based on pressure(s) determined before the dive and exclusive of the reserve breathing gas supply.

(5) Breathing gas(s) supplied to the diver(s) will be appropriate for the planned depth of the dive. In general, a diver’s Maximum Operating Depth (MOD) will be determined by a working PPO2 of ≤1.4, a resting PPO2 of ≤1.6, and an Equivalent Air Depth/Equivalent Narcosis Depth (EAD/END) of ≤130 feet.

(6) Each diver will be equipped with a timing device and depth indicator.

(7) Amount of weight and system used will be appropriate for the suit and depth of the dive.

(8) A cylinder harness with a quick release will be worn to secure the breathing gas to the diver.

(9) A personal floatation device will be worn at all times.

(10) Each diver will be capable of achieving and maintaining positive buoyancy.

(b) The following are additional minimum requirements for TAMUCC SCUBA Diving Operations for dives deemed “working”. Working dives will not be conducted:

   (1) To depths deeper than 130 feet.
   (2) To depths deeper than 100 feet or outside the no-decompression limits unless a decompression chamber is ready for use.
   (3) Against currents exceeding (1) knot unless diver is line-tended.
   (4) In enclosed or physically confining spaces unless diver is line tended and a diver is stationed at the underwater point of entry.
   (5) Unless the weight belt and cylinder harness is independently attached, permitting release of either one without interference by the other.
   (6) Unless each diver is equipped with a diver-carried reserve breathing gas supply consisting of:
      (i) An independent reserve cylinder with a separate regulator or connected to the underwater breathing apparatus.

NOTE: The valve of the reserve breathing gas supply will be in the closed position prior to the dive.

(7) Working dives will not be made with any gas mixture other than “air”, unless a decompression chamber is ready for use at the dive location.

5.2.3 Personnel Requirements

The following are minimum personnel requirements for SCUBA Diving operations. The qualifications of each appointee will comply with Section 4.19.3 “Assignments”.
### 5.2.4 Minimum Equipment

The minimum equipment required for SCUBA is:

(a) Harness/Backpack.
(b) Gas Cylinder and Valve.
(c) Regulator First Stage.
(d) Primary Second Stage.
(e) Back-up Second Stage.
(f) Buoyancy Compensator.
(g) Mask.
(h) Fins.
(i) Weight Belt and Weights.
(j) Timing devices (Diver’s and DPIC/Lead).
(k) Depth Gauge.
(l) Pressure Gauge.
(m) Dive tables and bottom timer or computer.
(n) Thermal Protection.
(o) Diving Ladder or other safe means of exiting the water.
(p) First Aid kit.
(q) Emergency Oxygen Supply.
(r) Field Dive Log Sheets.
(s) Written Dive Plan applicable to the job to be conducted.
(t) TAMUCC Diving Standards for Underwater Operations.

### 5.2.5 Pre-dive Checklist

The following are minimal guidelines that may require modification for each diving mode engaged in:

(a) Equipment Preparation
   (1) Assemble, layout, and inspect diving equipment intended for the job. Check for proper function, sizing, and signs of wear; replace and repair all as necessary.

(b) General Equipment
   (1) Check accessory equipment – tools, lights, special systems, spares, etc. – all on site and in working order.
   (2) Check diver entry and exit points.

(c) Prepare Gas Supplies
   (1) Check that breathing gas supplies are available in sufficient volumes to accommodate the diving mode, depth, and planned profiles, including emergency decompression.
   (2) Check Emergency Oxygen Supplies are of sufficient quantity to supply divers for the time required to transport them to a medical care facility, or 12 hours, whichever is less.
   (3) Ensure gas supply is sufficient in volume for accessory equipment throughout all phases of the operation.

(d) Activate and Test the Breathing Gas Supply
(1) Breathing Gas Hoses:
   (i) Verify all hoses have strain relief boots properly attached.
   (ii) Check for cracks and punctures.
   (iii) Check connections at the first and second stage are secure.

(2) Cylinders
   (i) Visually inspect cylinder for pitting, cracks, dents, or any evidence of weakness.
   (ii) Remove cylinder valve cover and inspect O-ring; replace as necessary.
   (iii) Check manifolds and valves. If equipped with a J valve, check reserve mechanism movement for ease of operation.
   (iv) Gauge cylinder pressure (J valve; reserve lever down/open position).
   (v) Verify j-valve is closed (lever in up position) signifying the cylinder is ready for use.

(3) Regulator
   (i) Attach regulator to cylinder. Slowly open cylinder valve. If applicable open reserve valve (lever in down position).
   (ii) Check for leaks.
   (iii) Check delivery - ensure breathing gas supply pressure is adequate to supply second stage.
   (iv) Close valve and if applicable close reserve mechanism (lever in up position).

(e) Final Preparations
   (1) Verify all necessary records, logs, and timesheets are at dive station.
   (2) Check that all appropriate decompression and treatment tables and protocols are in hand.

5.2.6 SCUBA Dive Operation Checklist

(a) Dive Briefing
   (1) Dive Objective(s).
   (2) Time & Depth.
   (3) Task & Team Assignments.
   (4) Tools & Techniques.
   (5) Hazards & Conditions.
   (6) Emergency Procedures (aborted dive, diver recall, injured diver).

(b) Scuba Pre-dive Inspection
   (1) Check Divers (mentally and physically prepared).
   (2) Check Equipment (Mask, Fins, Gloves, Hood, etc.).
   (3) Check Cylinder Valve(s) (fully open).
   (4) Check Gas Supply (via gauge & second stage).
   (5) Check Buckles (reach & rigging for quick release).
   (6) Check Weight Belt (outside of all other belts).
   (7) Check Hoses (proper routing).
   (8) Check Buoyancy Compensator (for function).
   (9) Check Regulator Second Stages (for function).
   (10) Review Dive Plan (questions).
   (11) OK Diver(s) to enter water.
   (12) Start Decent MARK TIME.

(c) Post Dive Procedures
   (1) Debrief each diver.
   (2) Check each diver’s physical condition.
   (3) Record Dive (on permanent record).
5.2.7 Other Requirements

If application of specific regulations is not clear, compliance will be based on one or both of the following:

(a) The regulations that promote the greater safety of divers.
(b) The DSO's decision as to safety and need.

5.3 SURFACE-SUPPLIED AIR DIVING

TAMUCC dive operations employing surface-supplied diving will comply with the following requirements, unless otherwise specified.

5.3.1 Defined

Surface-supplied diving is a diving mode in which the diver is supplied compressed gas for breathing from the surface dive location and is in voice communication with the surface.

5.3.2 Limitations

(a) The following are minimum requirements for TAMUCC Surface Supply Diving Operations:

(1) The approximate depth of each dive will be determined prior to the start of operations.
(2) A weight belt appropriate for the dress and depth of the dive will be worn.
(3) A separate safety harness with a positive buckling device will be worn. The harness will distribute the load on the diver's body, and will prevent any strain from being placed on the diver's mask or helmet when the umbilical attached to the lift ring on the harness is pulled.
(4) Surface-supplied dives will not exceed 190 feet.
(5) A decompression chamber will be ready for use at the dive location for any dive:
   (i) Outside the no-decompression limits.
   (ii) Deeper than 100 feet.
   (iii) Deemed “working” and using gas mixtures other than air (Section 5.4).
(6) Each surface-supplied diver will be continuously tended by a dive team member while in the water.
   NOTE: For dives deeper than 100 feet, outside the no-decompression limits, or when using mix gas, a separate dive team member will tend each diver in the water.
(7) A diver-carried reserve breathing gas supply will be provided for each diver.
(8) Each dive operation will have a primary breathing gas supply sufficient to support divers for the duration of the planned dive including decompression.
(9) A dive location reserve breathing gas supply will be provided.
(10) An operational two-way voice communication system will be used between each surface-supplied diver and dive team member at the dive location.
(11) Although voice communication with the surface tender is the primary means of communication, both divers and tenders will know and implement line pull signals in case of communication equipment failure.
(12) A diver will be stationed at the underwater point of entry when diving is conducted in enclosed or physically confining spaces.
(13) A standby diver will be available at the dive location while a diver is in the water.
5.3.3 Personnel Requirements

The following are minimum personnel requirements for surface-supplied dive operations. The qualifications of each appointee will comply with Section 4.19.3 “Assignments”.

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<th>Diving Mode</th>
<th>Diver(s)</th>
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<th>Lead</th>
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<td>1</td>
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<td>3</td>
<td>1</td>
<td>1</td>
<td>1&lt;100 feet</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2&gt;100 feet</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2&gt;100 feet</td>
<td>1</td>
<td>6</td>
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</table>

1 The DPIC or Lead may be assigned and assume the role provided they are trained and qualified.

5.3.4 Minimum Equipment

The minimum equipment required for Surface-supplied diving is:

(a) Adequate gas source with appropriate volume to support diver(s).
(b) Dive location, reserve gas source of appropriate volume to support complete diver evacuation.
(c) Umbilical/diving hose group, consisting of:
   (1) Gas supply hose.
   (2) Strength member.
   (3) Communications cable.
(d) A means of determining the diver depth.
(e) Decompression and treatment tables.
(f) TAMUCC Diving Standards for Underwater Operations.
(g) Control Station consisting of:
   (1) Communications system.
   (2) Gas Control Panel.
(h) Diving Ladder or other safe means of exiting diver from the water.
(i) Diver’s personal diving equipment consisting of:
   (1) Helmet or mask.
   (2) Weight belt if appropriate.
   (3) Protective clothing/thermal protection.
   (4) Tools as required.
   (5) Safety harness.
   (6) Diver-carried reserve breathing gas supply (bailout).
(j) Two time keeping devices (for surface personnel).
(k) First Aid kit.
(l) Emergency Oxygen Supply.
(m) Field Dive Log Sheets.
(n) Written Dive Plan applicable to the job to be conducted.

5.3.5 Pre-dive Checklist

(a) Equipment Preparation
   (1) Assemble, layout, and inspect all diving equipment and spares intended for the job. Check for wear; replace and repair as necessary.
   (2) Check all helmets and masks; ensure that they are within certification.
(b) General Equipment
   (1) Check accessory equipment – tools, lights, special systems, spares, etc. – are on site and in working order.
   (2) Check diver entry/exit ladder.
(c) Preparing Gas Supplies
(1) Check that breathing gas supplies (primary and secondary) comply with regulations for purity, and are properly mixed/filled to accommodate the dive mode and profile, including emergency decompression.

(2) Check that gas supply is sufficient in volume to accommodate the diving mode, depth, and planned profiles, emergency decompression, and any accessory equipment.

(3) Check over Bottom Pressure (OBP) is adequate for the intended depth and duration of the dive, will accommodate the helmet(s) or mask(s) as specified by the manufacturer and any accessory equipment.

(4) Check that minimum flow requirements for helmet(s) and mask(s) are to manufacturer’s specifications and will accommodate the diving contingent, including Standby Diver, and accessory equipment.

(5) Verify gas supplies have a filtration system installed in the supply line between the source and the diver’s hose connection.

(6) Verify all supply hoses running to and from the volume tank have proper leads, do not pass near high-heat areas, are free of kinks and bends, and are not exposed on deck in such a way that they can be rolled over, severed, or damaged by machinery or other means.

(d) Activate the Breathing Gas Supplies

(1) Volume Tank(s)

(i) Verify there is a properly functioning pressure gauge and the compressor meets delivery requirements.

(ii) Check valves and connections, petcocks, filler caps, overflow points, bleed valves, and drain plugs for leakage or malfunction of any kind.

(2) Cylinders

(i) Verify availability and suitability of reserve cylinders.

(ii) Check valves for proper operation and delivery.

(iii) Gauge cylinders for sufficient pressure.

(3) Breathing Gas Hoses

(i) Verify all high-pressure supply hoses have safety lines attached and strain relief devices properly installed.

(ii) Ensure all hoses have a clear lead and are protected from excessive heating or physical damage.

(iii) Briefly blow through hoses prior to connection.

(iv) Check breathing gas hoses and fittings for leaks and flow.

(v) Ensure breathing gas hoses (umbilical) are suitable for the gasses to be used and have been maintained in proper conditions of cleanliness.

(e) Test Equipment with Activated Breathing Gas Supply

(1) Check all exhaust and non-return valves.

(2) Hook up all breathing gas hoses to helmets and masks; make necessary connections to supply manifold.

(3) Ensure breathing gas supply is suitable for depth and diving mode.

(4) Verify flow to helmets and masks.

(5) Hook up and test all communications.

(f) Final Preparations

(1) Verify all necessary records, logs, timing modes, and timesheets are at the dive station.

(2) Check that all appropriate decompression and treatment tables and protocols are in hand.
5.3.6 Surface-supply Dive Operation Checklist

(a) Dive Briefing
(1) Dive Objective(s).
(2) Time & Depth.
(3) Task & Team Assignments.
(4) Tools & Techniques.
(5) Hazards & Conditions.
(6) Emergency Procedures (aborted dive, injured diver).

(b) Scuba Pre-dive Inspection
(1) Check Divers (mental and physically prepared).
(2) Check Equipment (Mask, Fins, Gloves, Hood, etc.).
(3) Check Primary Air.
(4) Check Secondary Air.
(5) Check Reserve Air.
(6) Check Secure Harness.
(7) Check Weight Belt (outside of all other belts).
(8) Check Umbilical (snap secure @ proper routing).
(9) Diver Air Check (primary, purge, EGS, & Ears).
(10) Check Communications.
(11) Review Dive Plan (questions).
(12) Assist Diver to Entry Point.
(13) OK Diver to enter water.
(14) Start Descent MARK TIME.

(c) Post Dive Procedures
(1) Debrief divers.
(2) Check the diver’s physical condition.
(3) Record Dive (on permanent record).

5.3.7 Other Requirements
If application of specific regulations is not clear, compliance will be based on one or both of the following:

(a) The regulations that promote the greater safety of divers.
(b) The DSO’s decision as to safety and need.

5.4 AIR-ALTERNATIVE GAS DIVING (AAG)
The following guidelines address the use of AAG under TAMUCC auspices as approved by the DCB.

5.4.1 Gasses Defined
For these standards:

(a) Air - Per CGA standard (Section 7.6) air is a gas mixture of 21-22% oxygen, ~78% nitrogen, and ~1% trace gasses. These compressed air standards, will be met whenever air is:
   (1) Placed in contact with oxygen concentrations >40%.
   (2) Used in Nitrox production by the partial pressure mixing method with gas mixtures containing >40% oxygen as the enriching agent.

(b) Oxygen - Two grades of oxygen are approved for use in TAMUCC dive operations:
   (1) Medical Grade - 99% oxygen content, is regulated as prescription drug, and maximum CO and CO2 levels are guaranteed.
   (2) Aviation Grade - Is optional, is 99.5% oxygen content, tested for moisture content.

(c) Nitrox - A gas mixture being comprised of an oxygen concentration higher than 22% by volume.
(d) Mixed-gas - A gas mixture composed of oxygen and an additional inert gas – >1% by volume – other than nitrogen.

NOTE: AAG Dive Plans will be approved by the DCB on a case by case basis.

5.4.2 Limitations

Employment of AAG, dive procedures, and protocols will first adhere to the criteria addressed throughout this standard as they apply to dives using "air". Additionally, AAG dives will meet the following criteria:

(a) Scientific Dives

(1) The divers will be previously certified and authorized to dive the gasses, as defined in Section 5.4.1(a-d), and proposed by a DCB approved internationally recognized agency.

(2) If the intended dives will require decompression, divers will be previously certified and authorized in decompression diving per requirements in Section 5.5 and the dive plan has approval by the DCB.

(3) Divers will demonstrate to the DCB’s satisfaction skills, knowledge, and attitude appropriate in the safe use of AAG.

(b) Working Dives with AAG will meet the following additional requirements:

(1) A decompression chamber will be at the dive location and ready use.

(2) A bell will be used when depths exceed 220 feet, alternatively, an in-water stage will be provided on dives >100 feet or outside no-decompression limits.

(3) When in-water decompression exceeds 120 minutes.

(c) Choice of breathing gas mixture will be weighed against proposed depth (Section 3.2), and in all cases, the following will apply:

(1) Maximum Operating Depth (MOD) per a given gas mixture will be determined by a working PPO2 of ≤1.4 and a resting PPO2 of ≤1.6.

(2) An Equivalent Air Depth (EAD) of ≤130 feet.

5.4.3 Prerequisites

(a) Eligibility

(1) Active divers of approved status (Sections 2.0 and 3.0) and currently diving under the auspices of TAMUCC are eligible to apply for authorization to use AAG.

(2) Additionally, in the case of Mixed-gas Diving, Nitrox certification and authorization is required.

(b) Application and Documentation

(1) Application for authorization to use AAG technology will be made per requirements for dive status, outlined in Sections 1.3.5 and 2.1.1, and via Appendices 1.A and 2.A.

5.4.4 Requirements for Authorization to Use Air-alternative Gas

(a) Final Approval

(1) Submission of documents and/or certifications does not authorize a diver to use AAG technology under the auspice of TAMUCC. The members of the DCB will feel the applicant is sufficiently skilled and proficient. Upon approval by the DCB, the DSO will sign the authorization form acknowledging authorization.

(2) After application approval, an applicant will be authorized to dive AAG within their certification and depth authorization, as specified in Section 3.2.

(b) Minimum Activity to Maintain Authorization
Authorization to dive AAG may be rescinded for any diver not demonstrating to the satisfaction of the DSO or DCB appropriate judgment or proficiency to ensure their safety or that of other divers.

The diver will log at least one AAG dive per year.

Failure to meet the minimum activity level may be cause for restriction or revocation of a mixed-gas authorization.

5.4.5 Air-alternative Gas Training Requirements

(a) General
Prior to obtaining authorization to use AAG, the following minimum requirements will be met:

(1) The diver will complete additional theoretical and practical training beyond the SDIT air certification level (Section 2.0 and 3.0) and be to the satisfaction of the TAMUCC DCB and DSO. This training may be used to satisfy the SD training requirements outlined in Section 3.1.2.

(2) Each diver will demonstrate proficiency in skills and theory via:

   (i) Written examinations covering the information presented in the classroom training session(s) (e.g., gas theory, oxygen toxicity, partial pressure determination, etc.).

   (ii) Practical examinations covering the information presented in the practical training session(s) (e.g., gas analysis, documentation procedures, etc.).

   (iii) Open water checkout dives, to appropriate depths, to demonstrate the application of theoretical and practical skills learned.

(b) Nitrox Training Guidelines

(1) Classroom Instruction
Topics will include, but are not limited to:

   (i) Review of previous training; physical gas laws pertaining to Nitrox; partial pressure calculations and limits; equivalent air depth (EAD) concept and calculations.

   (ii) Oxygen physiology and oxygen toxicity; calculation of oxygen exposure and maximum safe operating depth (MOD).

   (iii) Determination of decompression schedules (both by EAD method using approved air dive tables, and using approved Nitrox dive tables).

   (iv) Dive planning and emergency procedures; mixing procedures and calculations.

   (v) Gas analysis.

   (vi) Personnel requirements.

   (vii) Equipment marking and maintenance requirements.

   (viii) Dive station requirements.

   (ix) The TAMUCC DCB may choose to limit standard Nitrox diver training to procedures applicable to diving, subsequently reserve training such as Nitrox production methods, oxygen cleaning, and dive station topics to divers requiring specialized authorization in these areas.

(2) Practical Training
Practical training will consist of the following:

   (i) Oxygen analysis and logging of Nitrox mixtures.

   (ii) Determination of MOD, oxygen partial pressure exposure, and oxygen toxicity time limits, for various Nitrox mixtures at various depths.
(iii) Determination of nitrogen-based dive limits status by EAD method using air dive tables, Nitrox dive tables, and gas mixing software as approved by the DCB.
(iv) Dive computer use may be included, as approved by the DCB (Sections 5.4.7(d), 5.6, and 7.1.3).

(3) Written Examination
Before authorization, the trainee will successfully pass a written examination demonstrating knowledge of at least the following:
(i) Function, care, use, and maintenance of equipment cleaned for Nitrox use.
(ii) Physical and physiological considerations of Nitrox diving (e.g. O2 and CO2 toxicity).
(iii) Diving regulations and procedures as related to Nitrox diving, either scuba or surface-supplied (depending on intended mode).
(iv) Given the proper information, calculation of:
   - Equivalent air depth (EAD) for a given fO2 and actual depth.
   - PPO2 exposure for a given fO2 and depth;
   - Optimal gas mixture for a given PPO2 exposure limit and planned depth;
   - Maximum operational depth (MOD) for a given mix and PPO2 exposure limit;
   - For Nitrox production purposes, percentages/psi of oxygen in a given mixture, and psi of each gas required to produce a fO2 by partial pressure mixing.
(v) Dive table and dive computer selection and usage.
(vi) Nitrox production methods and considerations.
(vii) Oxygen analysis.
(viii) Nitrox operational guidelines (Section 5.4), dive planning, and dive station components.

(4) Open water Dives
(i) A minimum of two supervised open-water dives using Nitrox technology is required for authorization. The mode used in the dives will correspond to the intended application (i.e., scuba or surface-supplied).
(ii) If the MOD for the mix being used can be exceeded at the training location, direct, in-water supervision is required.

(c) Mixed-gas Training Guidelines
(1) Classroom Instruction
(i) Review of topics and issues previously outlined in Nitrox and required decompression diving training as pertinent to the planned operations.
(ii) The use of helium or other inert gases, and the use of multiple decompression gases.
(iii) Equipment configurations.
(iv) Mixed-gas decompression planning.
(v) Gas management planning.
(vi) Thermal considerations.
(vii) Mission planning and logistics.
(viii) Emergency procedures.
(ix) Mixed-gas production methods.
(x) Methods of gas handling and cylinder filling.
(xi) Oxygen exposure management.
(xii) Mixed-gas physics and physiology.

(2) Practical Training:
   (i) END determination.
   (ii) Gas analysis.
   (iii) Confined water session(s) in which divers demonstrate proficiency in required skills and techniques for proposed diving operations.

(3) Open water Dives
   (i) A minimum of six open-water training dives.
   (ii) At least one initial dive will be in 130 feet or less to practice equipment handling and emergency procedures.
   (iii) Subsequent dives will gradually increase in depth, with a majority of the training dives being conducted between 130 feet and the planned operational depth.
   (iv) Planned operational depth for initial training dives will not exceed 260 feet.
   (v) Diving operations beyond 260 feet require additional training dives.
   (vi) Review of topics.

(d) Surface-Supplied Training
   All training as applied to surface-supplied diving (practical, classroom, and open-water) will follow the surface-supplied diving standards (Section 5.3), including additions listed in Section 5.4.

5.4.6 Air-alternative Gas Dive Personnel Requirements

(a) Scientific Diver-in-Training – a diver who has completed the requirements of Sections 2.0 and 3.0, and the authorization and training sections of these guidelines (Section 5.4.4 and 5.4.5), may be authorized by the DCB and DSO to use AAG (per certification – e.g. Nitrox or mixed-gas) under the direct supervision of another diver who holds the equivalent AAG authorization. Dive depths are restricted to those specified in the diver’s authorization.

(b) Scientific Diver – a diver who has completed the requirements of Section 3.1.2 and the training and authorization sections of these guidelines (Section 5.4.4 and 5.4.5) may be authorized by the DCB and DSO to use AAG. Depth authorization to use AAG will be the same as those specified in the diver’s authorization, as described in Section 3.2.

(c) DPICs and Leads – on any dive during which AAG will be used by any team member, will be qualified to assume the roles as outlined in Section 4.19.3(a) and (b) and will have completed the authorization and training sections of these guidelines (Section 5.4.4 and 5.4.5). DPIC and Lead role assignments will be approved prior to project commencement by the DCB and/or DSO as part of the Dive Plan approval process. In addition to the responsibilities listed in Section 4.19.3(a) and (b), the DPICs and Leads will:

   (1) As part of the dive planning process, verify all divers using AAG on a dive are properly qualified and authorized.
   (2) As part of the pre-dive procedures, confirm with each diver the gas mixture(s) the diver is using, and establish dive team maximum depth and time limits, according to the shortest time limit or shallowest depth limit among the team members.
   (3) The DPIC/Lead will also reduce the maximum allowable PPO2 exposure limit for the dive team if on-site conditions so indicate (Section 5.4.7(a)(2)).
5.4.7 Dive Parameters

(a) Oxygen Exposure Limits

(1) The inspired oxygen partial pressure experienced at depth will not exceed 1.4 ATA while at working (e.g. swimming) and 1.6 ATA when at rest (e.g. during decompression). All dives performed using AAG will comply with the current NOAA Diving Manual “Oxygen Partial Pressure Limits for ‘Normal’ Exposures.

(2) The maximum allowable exposure limit will be reduced in cases where cold or strenuous dive conditions, or extended exposure times are expected. The DCB will consider this in the review of any dive plan application, which proposes to use AAG. The DPIC/Lead will also review on-site conditions and reduce the allowable PPO2 exposure limits if conditions indicate.

(3) If using the equivalent air depth (EAD) method the maximum depth of a dive will be based on the oxygen partial pressure for the specific breathing gas used. NOTE: TAMUCC standing policy for EAD/END, in all dives, regardless of gas used will be ≤130 feet.

(b) Bottom Time Limits

(1) Maximum bottom time will be based on the depth of the dive and the gas mixture(s) being used.

(2) Bottom time for a single dive will not exceed the NOAA maximum allowable “Single Exposure Limit” for a given oxygen partial pressure, as listed in the current NOAA Diving Manual.

(c) Dive Tables and Gases

(1) A set of DCB approved dive tables will be available at the dive site.

(2) When using the equivalent air depth (EAD) method, dives will be conducted using air dive tables.

(3) If AAG’s are used to increase the safety margin of air-based dive tables, the MOD and oxygen exposure and time limits for the gas mixtures being dived will not be exceeded.

(4) Breathing mixtures used while performing in-water decompression, or for bailout purposes, will contain the same or greater oxygen content as that being used during the dive, within the confines of depth limitations and oxygen partial pressure limits set forth above (Section 5.4.7(a)(1)).

(d) Dive Computers

(1) Computers may be used to compute decompression status during AAG dives. Manufacturers’ guidelines and operations instructions will be followed.

(2) Use of dive computers will comply with the guidelines as outlined in Section 5.6.

(3) Computer users will demonstrate a clear understanding of the display, operations, and manipulation of the unit being used for diving prior to using the computer, to the satisfaction of the DSO or designee.

(4) If AAG is used to increase the safety margin of an air-based dive computer, the MOD and oxygen exposure and time limits for the gas mixture being dived will not be exceeded.

(5) Dive computers capable of PPO2 limit and fO2 adjustment will be checked by the diver prior to the start each dive to assure compatibility with the gas mixture being used.

(e) Repetitive Diving

(1) Repetitive dives using AAG will be performed in compliance with procedures required of the specific dive tables used.
(2) Residual nitrogen time will be based on the EAD/END for the specific gas mixture to be used on the repetitive dive, and not that of the previous dive.

(3) The total cumulative exposure (bottom time) to a partial pressure of oxygen in a given 24 hour period will not exceed the current NOAA Diving Manual 24-hour Oxygen Partial Pressure Limits for “Normal” Exposures.

(4) When repetitive dives expose divers to different oxygen partial pressures from dive to dive, divers will account for accumulated oxygen exposure from previous dives when determining acceptable exposures for repetitive dives. Both acute (CNS) and chronic (pulmonary) oxygen toxicity concerns will be addressed and divers will be monitored continuously for signs of O2 toxicity.

(f) Gas Mixing and Analysis for Organizational Members

(1) Personnel Requirements.
   (i) Individuals responsible for producing and/or analyzing gas mixtures will be knowledgeable and experienced in all aspects of the technique.
   (ii) Only individuals approved by the DSO and/or DCB will be responsible for mixing and/or analyzing gas mixtures.

(2) Production Methods - It is the responsibility of the DCB to approve the specific gas production method used.

(3) Analysis Verification by User.
   (i) It is the responsibility of each diver (Scuba), and DPIC and Lead (surface supply) to analyze, prior to the dive, the oxygen content of all cylinders and acknowledge in writing the following information for each vessel: fO2, MOD, vessel pressure, date of analysis, and analyzer’s name/initials.
   (ii) Individual dive log reporting forms will report fO2 of the Nitrox mix, if different from 21%, and the fHe if mixed-gas is used.

5.4.8 Air-alternative Gas Diving Equipment

All diver and support equipment should be suitable for the fO2 being used. Due to the added complexities involved in the use of AAG technologies, (e.g. higher than normal fO2’s and the addition of other inert gasses, e.g. Helium), special attention will be placed on meeting ALL of the equipment criteria as outlined in Section 7.0.

5.5 Staged Decompression Diving

Decompression diving shall be defined as any diving during which the diver cannot perform a direct return to the surface without performing a mandatory decompression stop to allow the release of inert gas from the diver’s body. The following procedures shall be observed when conducting dives requiring planned decompression stops.

5.5.1 Minimum Experience and Training Requirements

(a) Prerequisites
   (1) SD qualification according to Section 3.1.2.
   (2) Minimum of 100 logged dives.
   (3) Demonstration of the ability to safely plan and conduct dives deeper than 100 feet.
   (4) Nitrox certification/authorization in accordance to the requirements outlined in Section 5.4.

(b) Training
   (1) A minimum of 6 hours of classroom training to ensure theoretical knowledge to include: physics and physiology of decompression; decompression planning and procedures; gas management; equipment
configurations; decompression method, emergency procedures, and omitted decompression.

(2) At least one training session will be conducted in a pool or sheltered water setting, to cover equipment handling and familiarization, swimming and buoyancy control, to estimate gas consumption rates, and to practice emergency procedures.

(3) A minimum of six open-water training dives simulating/requiring decompression shall be conducted, emphasizing planning and execution of required decompression dives, and including practice of emergency procedures.

(4) Progression to greater depths shall be by 4-dive increments at depth intervals as specified in Section 3.2.2.

(5) No training dives requiring decompression shall be conducted until the diver has demonstrated acceptable skills under simulated conditions.

(6) The following are the minimum skills the diver must demonstrate proficiently during dives simulating and requiring decompression:

(i) Buoyancy control.
(ii) Proper ascent rate.
(iii) Proper depth control.
(iv) Equipment manipulation.
(v) Stage/decompression cylinder use as pertinent to planned diving operation.
(vi) Buddy skills.
(vii) Gas management.
(viii) Time management.
(ix) Task loading.
(x) Emergency skills.

(7) Divers shall demonstrate to the satisfaction of the DSO, or qualified designee, proficiency in planning and executing required decompression dives appropriate to the conditions in which diving operations are to be conducted.

(8) Upon completion of training, the diver shall be authorized to conduct required decompression dives with DSO approval.

5.5.2 Minimum Equipment Requirements

(a) Valve and regulator systems for primary (bottom) gas supplies shall be configured in a redundant manner that allows continuous breathing gas delivery in the event of failure of any one component of the regulator/supply system.

(b) Cylinder volume and configuration will be adequate for planned dive operation.

(c) One of the second stages on the primary gas supply shall be configured with a hose of adequate length to facilitate effective emergency gas sharing in the intended environment.

(d) Minimum dive equipment shall include:

   (1) Snorkel is optional at the DCB's discretion, as determined by the conditions and environment.
   (2) Diver location devices adequate for the planned diving operations and environment.
   (3) Compass.

(e) Redundancy in the following components is desirable or required at the discretion of the DCB or DSO.

   (1) Decompression Schedules.
   (2) Dive Timing Devices.
   (3) Depth Gauges.
   (4) Buoyancy Control Devices.
   (5) Cutting Devices.
   (6) Lift Bags and Line Reels.
5.5.3 Minimum Operational Requirements

(a) Approval of dive plan applications to conduct required decompression dives shall be on a case-by-case basis.
(b) The maximum pO2 to be used for planning required decompression dives is 1.6. It is recommended that a pO2 of less than 1.6 be used during bottom exposure.
(c) Diver’s gas supplies shall be adequate to meet planned operational requirements and foreseeable emergencies.
(d) Decompression dives may be planned using dive tables, dive computers, and/or PC software approved by the DSO/DCB.
(e) Breathing gases used while performing in-water decompression shall contain the same or greater oxygen content as that used during the bottom phase of the dive.
(f) The dive team prior to each dive shall review emergency procedures appropriate for the planned dive.
(g) If breathing gas mixtures other than air are used for required decompression, their use shall be in accordance with those regulations set forth in the appropriate sections of this standard.
(h) The maximum depth for required decompression using air as the bottom gas shall be 190 feet.
(i) Use of additional nitrox and/or high-oxygen fraction decompression mixtures as travel and decompression gases to decrease decompression obligations is encouraged.
(j) Use of alternate inert gas mixtures to limit narcosis is encouraged for depths greater than 150 feet.
(k) If a period of more than 6 months has elapsed since the last decompression dive, a series of progressive workup dives to return the diver(s) to proficiency status prior to the start of project diving operations are recommended.
(l) Mission specific workup dives are recommended.

5.6 Dive Computer Diving

The following are minimum considerations for the use of dive computers.

(a) Only those makes and models of dive computers specifically approved by the TAMUCC DCB may be used.
(b) Any diver desiring the approval to use a dive computer as a means of determining decompression status must apply to the DCB, complete an appropriate practical training session, and pass a written examination.
(c) Each diver relying on a dive computer to plan dives and indicate or determine decompression status must have their own unit.
(d) On any given dive, divers in the buddy team will follow the most conservative dive computer.
(e) If the dive computer fails at any time during the dive, the dive will be terminated and appropriate surfacing procedures will be initiated.
(f) A diver will not dive for 18 hours before activating a dive computer to use it to control their diving.
(g) Once the dive computer is in use, it must not be switched off until it indicates complete off-gassing has occurred or 18 hours have elapsed, whichever comes first.
(h) When using a dive computer, non-emergency ascents will be at a rate specified for the make and model of dive computer being used.
(i) Whenever practical, divers using a dive computer should make a stop between 10 and 30 feet for 5 minutes, especially for dives below 60 fsw.
(j) Multiple deep dives require special consideration.
Section 6.0

Records and Record Keeping
6.0 **RECORDS AND RECORDKEEPING**

6.1 **DIVE EQUIPMENT RECORDS**

See Section 7.3, Equipment Testing and Record Keeping.

6.2 **MEDICAL RECORDS**

See Section 8.5, Medical Records (Section 8.0) will be kept for five years per OSHA CFR 1910.440(b)(3)(i).

6.3 **OPERATIONAL DIVE LOG**

During each dive operation the following information will be recorded (Appendix 6.A):

(a) Name of DPIC.
(b) Divers name(s).
(c) Buddy(ies)/tender.
(d) Water entry, exit, and total dive time.
(e) Gas pressure at beginning and end of dive, and total gas expended.
(f) Maximum depth.
(g) Dive objective(s).
(h) Approximate underwater and surface conditions (visibility, water temperature, and current, etc.).

6.4 **OPERATIONAL DIVE RECORD**

At the conclusion of each dive operation, including completion of decompression procedure assessments where there has been an incident of decompression sickness, the following information will be permanently recorded. The Annual Statistics Form (Appendix 6.B) is partial a document. To see entire Operational Dive Record and layout contact DSO:

(a) Names of dive team members, including the DPIC/Lead.
(b) Date, time, and location.
(c) Diving modes used.
(d) General nature of work performed.
(e) Approximate underwater and surface conditions (visibility, water temperature, current, etc.)
(f) Maximum depth and bottom time of each diver.
(g) For each dive outside of the no-decompression limits, deeper than 100 feet or using mixed-gas, the following additional information will be recorded and maintained:
   1) Depth-time and breathing gas profile.
   2) Decompression table designation (including modification).
   3) Elapsed time since last exposure if less than 24 hours or repetitive dive designation for each diver.
(h) For each dive in which decompression sickness is suspected or symptoms are evident, the following additional information will be recorded and maintained:
   1) Description of decompression sickness symptoms (including depth and time of onset).
   2) Description and results of treatment.

6.5 **PERSONAL DIVING LOG**

Each diver will log every dive made under the auspices of TAMUCC. Log sheets will be submitted to the DSO at the end of each month and will be placed in the diver's permanent file. The diving log will include the following:

(a) Name of diver, buddy /tender, and DPIC/Lead.
(b) Date, time, and location.
(c) Maximum depth(s), bottom time(s), and surface interval.
(d) Purpose of dive(s).
(e) General nature of diving activity.
(f) Approximate surface and underwater conditions.
(g) Repetitive status of dives.
(h) Dive Mode (e.g. SCUBA, Surface-supplied).
Mixed-gas profiles, if applicable.
Dive tables or computer used.
Detailed report of any accidents or potentially dangerous incidents.

6.6 RECORD MAINTENANCE
The DSO will maintain permanent records for all diving related matters under the auspices of Texas A&M University - Corpus Christi.
Diving personnel files will include, but not be limited to, the TAMUCC diver application, log sheets, physical examination, waiver, certification or understanding of diving and disciplinary regulations and other pertinent information deemed necessary by the DCB and/or the DSO.

6.6.1 Availability of Records:

(a) Upon request of the Assistant Secretary of Labor for OSHA, or the Director, National Institute for Occupational Safety and Health, Department of Health and Human Services or their designees, TAMUCC will make available for inspection and copying any record or document required by the OSHA standard.
(b) Records and documents required by OSHA Standard 29 CFR 1910 Subpart T will be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with 29 CFR 1910.20 (a)-(e), and (g).
(c) TAMUCC Diving Standards for Underwater Operations, depth-time profiles, recordings of dives, (including decompression procedure assessments and evaluations) and records of hospitalizations will be provided in the same manner as employee exposure records or analyses using exposure or medical records. Equipment inspections and testing records that pertain to employees will also be provided upon request to employees and their designated representatives.
(d) Records and documents required by Texas A&M University - Corpus Christi, OSHA Standard 29 CFR, and AAUS will be retained for the following period:

1. Physician reports of diver medical examinations – minimum of five years after date of last hyperbaric exposure.
2. TAMUCC Diving Standards for Underwater Operations – current document only.
3. Depth-time profile until the completion of the recording of dive, or until completion of decompression procedure assessment, where there has been an incident of decompression sickness.
4. Record of dive – minimum of one year, five years where there has been an accident or pressure-related injury or incidence of non-compliance with university rules.
5. Pressure-related injury assessment - five years.
6. Equipment inspection and testing records - current entry or tag, or until equipment is withdrawn from service.
7. Records of hospitalization - five years.
8. After the expiration of the retention period of any record required to be kept for five (5) years, TAMUCC will forward such records to OSHA, Department of Health and Human Services. TAMUCC will also comply with any additional requirements set forth at 29 CFR 1910.20(h).

6.7 TERMINATION OF DIVE PROGRAM
In the event the Texas A&M University–Corpus Christi dive program ceases to exist:

(a) The successor employer will receive and retain all dive and employee medical records required by 29 CFR 1910.
(b) If there is no successor employer, dive, and employee medical records will be forwarded to the National Institute for Occupational Safety and Health, Department of Health and Human Service.
# APPENDIX 6.A - OPERATIONAL DIVE LOG

<table>
<thead>
<tr>
<th>Location</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diver’s Name</td>
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</table>

**Gas Mixture** (O2/N/He)

**Dive Designation (a-z)**

**Prev. Rep. Group.**

**Surface Interval**

**New Rep. Group.**

**Planned Max. Depth**

**No-Decomp. Limit**

**Resid. Nitrog. Time**

**Adj. No-Deco Time**

**Planned In Water Time**

**Diver’s Initials**

**DPIC/Lead**

**Safety Diver(s)**

**Purpose**

- Science
- Working
- Training
- Proficiency
- Recreational

**Dive Mode**

- SCUBA
- Surface Supply
- Rebreather
- Hookah

**Dive Planner**

- Computer
- Software

**Environment**

- Saltwater
- Freshwater
- Open Water
- Confined Water

**Entry**

- Shore
- Boat
- Platform
- Other

**Descent**

- Down-line
- Free Descent

**Work Site Position**

- Full Face Mask
- Hard Hat
- Communications

**Cylinder Size**

**Cylinder Press. In**

**Cylinder Press. Out**

**Gas Expended**

**Date**

**Page**

**Check the following that apply:**

- Temperature
- Structure
- Ice
- Cave
- Wreck
- Low Visibility
- Specialties
- Current
- Oil/Gas Rig
- Artificial Reef
- Night
- Research
- Collection
- Photography
- Navigation
- Altitude
- Search/Recovery
- Rescue
- Accident Mgmt.
- Decompression
- Blue Water
- Aquarium

**Maximum Depth**

**Repetitive Group.**

**Cylinder Press. Out**

**Cylinder Press. In**

**Gas Expended**
## APPENDIX 6.B

### OPERATIONAL DIVE RECORD – ANNUAL STATISTICS FORM

<table>
<thead>
<tr>
<th>Dives By Purpose</th>
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<tr>
<td>Working</td>
<td>Dive Times</td>
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<tr>
<td>Training &amp; Proficiency</td>
<td>Dive Times</td>
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<td>Non-Duty / Recreational</td>
<td>Dive Times</td>
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Section 7.0

Equipment and Systems
7.0 **EQUIPMENT AND SYSTEMS**

The DCB and/or the DSO will approve the following equipment before it may be used for any dive activity under the auspices of TAMUCC. Equipment subject to extreme usage under adverse conditions will undergo more frequent testing and maintenance. All equipment will be examined by the person(s) using that equipment and be serviced according to manufacturer recommendations.

The use of university owned or controlled diving equipment will be limited to individuals officially participating in TAMUCC dive programs and as specified in Section 3.0 (Diver Status). TAMUCC will not be held liable for the safety of persons involved in the unauthorized use of university diving equipment.

7.1 **DIVING EQUIPMENT**

7.1.1 **Cylinders and Valves**

Cylinders and valves will:

(a) Be designed and constructed in accordance with the applicable provisions of the unfired Pressure Vessel Safety Orders, 29CFR 1910.101 and 1910.171.

(b) Be equipped with a pressure relief device.

(c) Be stored in a ventilated area and protected from excessive heat.

(d) Be secured from falling.

(e) Have shut off valves recessed into the cylinder or protected by a cap, except when in use, connected by manifold, or used for SCUBA diving.

(f) Be labeled of contents except when used for SCUBA Air diving and marked in an identifying manner if used with gas mixtures containing >40% oxygen.

(g) When used for mixed-gas Diving (Section 5.4) cylinders will also conform to the following criteria:

1. **General**
   
   (i) Cylinders will be free of all unnecessary stickers, banners, and markings. VIP labels (Section 7.3.2) will be fixed to the bottom.

   (ii) Each cylinder will be marked horizontally on two sides with 3" high numbers indicating the MOD (Section 5.4.2(c)), e.g. "120". NOTE: Oxygen cylinders will be marked horizontally with "20" and the word "OXYGEN" to prevent confusion of cylinder MOD's of 70 or 120 feet.

   (iii) Content information resulting from analysis will be placed at the neck of the cylinder and contain the:

      • Percentage of O2 for oxygen or NITROX mixes and the O2 and Inert gas percentages for mixed-gas.
      • Date.
      • Initials of the person analyzing the mixture.

2. **Alternative Labeling**

   (i) Dedicated Nitrox Service Cylinders:

      • May be marked "NITROX", "EANx", or "Enriched Air".
      • Nitrox identification color-coding will include a 4" wide green band around the cylinder, starting immediately below the shoulder curvature. If the cylinder is not yellow, the green band will be bordered above and below by a 1" yellow band.
      • Other markings will have prior approval of the DCB.

7.1.2 **Oxygen Analyzers**

Oxygen analyzers:

(a) Are required when employing AAG technologies (Section 5.4).

(b) Will be capable of determining the oxygen content in the cylinder.
7.1.3 Dive Tables and Dive Computers
Dive tables and Dive computers:
(a) Will be approved by the DCB and/or the DSO prior to the beginning of a project.
(b) Dive tables, appropriate for the dive project, regardless of the use of computers by the diver, will be available at the dive location at all times.

7.1.4 Flotation Devices
Floatation devices will meet the following criteria:
(a) Personal flotation systems, buoyancy compensators, dry suits, or other variable volume devices, directly or indirectly connected to a helmet or mask, will be equipped with an exhaust valve.
(b) When used for SCUBA diving, a buoyancy compensator will have an inflation source separate from the breathing gas supply.
(c) An inflatable floatation device, capable of maintaining the diver at the surface in a face-up position, having a manually activated source of inflation, independent of the breathing supply, an oral inflation device, and an exhaust valve will be used for SCUBA diving.
(d) Each Diver will have the capability of achieving and maintaining positive buoyancy.

7.1.5 Harnesses
Harnesses will:
(a) Be made of a suitable strength material to lift the diver and their equipment from the water.
(b) Have a positive buckling device.
(c) Have a mechanical quick release between them and the umbilical.
(d) Be constructed and fitted to prevent an unconscious diver from slipping free of the harness, or from strain being placed on mask or helmet.
(e) Not be used as a weight belt.
(f) Be designed to prevent restriction of the diver’s breathing when their full weight is supported by the harness.
(g) Be equipped with a quick release when used to secure a cylinder to a diver in a SCUBA mode.

7.1.6 Helmets and Masks
Breathing masks and helmets will:
(a) Have a non-return valve at the attachment point between the helmet or mask and main gas supply hose, which will close readily and positively.
(b) Have an exhaust valve.
(c) Be capable of ventilating the required (ACFM) of gas when supplied at the pressure recommended by the manufacturer of the equipment at any depth at which they are operated. NOTE: In all cases, the minimum required ventilation rate in ACFM will be in accordance with the manufacturer’s design recommendations.
(d) Be capable of maintaining an inspired CO2 partial pressure below .02 ATA when the diver is producing carbon dioxide at the rate of 1.6 standard liters per minute.
(e) Be fitted with a two-way audio communications system.
(f) Have check valves with springs not exceeding 3 psi cracking pressure.
(g) Be made of corrosion resistant materials.
(h) Be protected from over pressurization.
7.1.7 **Hoses**

Breathing supply hoses will:

(a) Have a Maximum Allowable Working Pressure (MAWP) equal or greater than maximum depth of the dive relative to supply source plus 150 psi.

(b) Have a rated bursting pressure at least equal to four times the MAWP.

(c) Have a MAWP and flow rating, no less than the system in which it is installed and be suitable for the service intended.

(d) Have connectors with pressure capabilities equal or greater than the hose on which they are installed.

(e) Be kink resistant and arranged to prevent kinking.

(f) Be suitable for breathing gas service.

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

(h) Be designed not to collapse when used for operation with higher external pressure than internal.

Breathing-supply hose connectors will:

(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.

(c) Be resistant to accidental disengagement.

**Umbilical** will:

(a) Be marked in 10-foot increments to 100 feet beginning at the diver’s end, and in 50-foot increments thereafter.

(b) Be marked with a unique identity and subject to a planned maintenance program.

(c) Consist of a breathing gas hose, communications cable, a means of determining the diver’s depth, and strength member.

(d) Have strength members unaffected by immersion in water for extended periods.

(e) Have minimum break strength of the hose assembly, including terminating hardware, of 1000 lbs.

7.1.8 **Regulators**

SCUBA regulators will:

(a) Consist of a first stage and a primary and back-up second stage.

(b) Second stages will be of a “downstream” design.

(c) Have a functional submersible pressure gauge.

(d) Be cleaned and maintained for oxygen service, and marked in an identifying manner if used with gas mixtures containing >40% oxygen.

(e) Be suitable for the O2 being used.

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

Timing devices and gauges for divers allowing constant monitoring of dive depth, time, and gas availability will be chosen as appropriate to the diving mode.

(a) For SCUBA diving, each diver will have:

(1) A depth gauge capable of being monitored by the diver during the dive.

(2) A timing device capable of being monitored by the diver during the dive.

(i) An additional time keeping device will be available at each dive location.

(3) A cylinder pressure gauge capable of being monitored by the diver during the dive.

(b) For Surface-supplied diving:
(1) A gauge allowing monitoring of each diver’s depth will be at the dive location, except when a known maximum depth attainable by the diver is used for all dive operation calculations.

(2) Gauges allowing monitoring of available gas will be at the dive site.

(3) Gauges utilized will:
   (i) Be suitable for purpose intended.
   (ii) When used to indicate a diver’s depth will:
        • Be of appropriate range and gradation.
        • Graduated in units consistent with the decompression tables utilized.

(4) Two time keeping devices will be available at the dive location and will:
   (i) Be suitable for the purpose and easily read.
   (ii) Not be used when an error exceeding one quarter of one minute in four hours exists.

7.1.10 Weights Belts
The Diver’s weight belt or assembly:
   (a) Will be capable of quick release.
   (b) Will be attached to the diver in such a manner to avoid accidental disengagement.
   (c) Will, during surface-supply operations:
        (1) Be of sufficient weight to maintain the diver at working depth.
        (2) Not be used as an attachment point for the diving umbilical.

7.1.11 Diver-Carried Reserve Breathing Supply
Bailout systems will:
   (a) Be independent of the primary gas supply.
   (b) Be provided for all SCUBA and surface supplied working dive operations
   (c) Have a cylinder meeting the requirements of paragraph 7.1.2 and 7.3.2.
   (d) Have a regulator on the cylinder capable of delivering the proper pressure and flow to the diver, helmet, or mask, in accordance with the flow characteristics recommended by the manufacturer.
   (e) In the case of surface supplied dives, have a means of attachment to a helmet or full-facemask that prevents accidental disengagement.
   (f) Will provide indication to the diver their reserve has been actuated. Such indication can be the requirement of the diver to open a valve, a visual signal, or other appropriate method.
   (g) Be of sufficient duration for use until the diver can reach; the surface from the maximum depth of the dive; another source of breathing media; or be reached by a standby diver equipped with another source of breathing media.
   (h) Contain a physiologically appropriate breathing gas mixture to accommodate the mode of diving and depth requirements.
   (i) In all cases, when activated, cause the dive to be aborted. The reason for activation will be ascertained and corrected prior to continued use of the involved equipment.

7.2 Support Equipment
7.2.1 Dive Flags/Warning Signals
When diving in areas capable of supporting marine traffic, a rigid replica of the international code flag “A” will be displayed at the dive location. Flag will be appropriate in size and flown in a manner allowing all-around visibility and with illumination during night diving operations.

7.2.2 Diver Entry and Egress Systems
Entry and egress systems will:
   (a) Be capable of supporting the weight of two divers plus their gear.
(b) Be made of corrosion resistant materials.
(c) Be suitable for the intended purpose.
(d) If, in the form of a ladder, will extend three feet below the surface when installed.

7.2.3 Emergency Equipment
(a) First Aid Kit shall:
(1) Be adequate for the dive operation will be on site and readily available during all dive operations.

(b) Emergency Oxygen Supply shall have:
(1) 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.
(2) Regulators 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.
(3) Hold a sufficient quantity of oxygen to supply two divers for:
   (i) The time required to transport them to a higher-level medical care facility; or
   (ii) 12 hours, whichever is less.
(4) The regulator and positive pressure/demand regulators used to deliver oxygen shall be tested annually to ensure delivery pressure is within the manufacturer’s specifications.

7.2.4 Hand-held Power Tools
The DCB or DSO will approve electrical tools and equipment used underwater, and they will be designed specifically for this purpose.

7.3 DIVING EQUIPMENT MAINTENANCE, SERVICE AND RECORD KEEPING
7.3.1 General
Suitable equipment logs will be established and maintained in a correct and current condition with all:
(a) Equipment having a unique identity and be traceable to the equipment log.
(b) Entries in the log describing the nature of work performed, including dates of modification, repair or test, the name or initials of the individual performing the work or test and their signature, and the serial number of the particular piece of equipment involved.

7.3.2 Oxygen Cleaning and Maintenance
(a) Service Requirements.
(1) ALL equipment used with oxygen or mixtures containing over 40% by volume oxygen will be designed and maintained for oxygen service.
(2) ALL components exposed to concentrations >40% oxygen at pressures above 150 psi, will be cleaned, and maintained for oxygen service.
(3) Oxygen systems over 125 psig will have slow-opening shut-off valves.

7.3.3 Cylinders and Valves
(a) SCUBA Cylinders will:
(1) Have a unique identity with results of all tests being recorded in the equipment log.
(2) Cylinders used in diving operations will be maintained in accordance with the provisions of the Pressure Vessel Safety Orders (reference OSHA standards - 29 CFR 1910.101 and 1910.169 through 1910.171).
(3) Cylinders will be hydrostatic tested to one and a half the MAWP, or code requirements, every fifth year in accordance with Department of Transportation (DOT) standards.
(4) Cylinders will have an internal and external visual inspection for corrosion and damage at intervals not to exceed 12 months. An inspection sticker (VIP) will be affixed to bottom of the cylinder indication the date of next VIP requirement.

(b) Valves will:
   (1) Be functionally tested at intervals not to exceed 12 months.

7.3.4 Flotation Devices
All floatation devices will be examined and tested before use by the person using them. Functional inspections and tests will occur at intervals not to exceed 12 months.

7.3.5 Helmets and Masks
(a) The non-return valve at the attachment point between helmet or mask and main gas supply hose will be tested regularly to ascertain that it closes readily and positively.
(b) The exhaust valve will be tested regularly to be certain it is in working order.
(c) Manufacturer’s specifications will be maintained and all modifications that effect safety or performance will be documented.

7.3.6 Hoses
Hoses will be tested at least annually to 1.5 times their working pressure with a 200-lb. axial load applied on fittings while initial test pressure is applied. The test pressure will be maintained without loss of pressure for ten minutes.

7.3.7 Regulators
(a) TAMUCC regulators and those privately owned and used on TAMUCC projects, will be inspected and maintained at 12-month intervals by procedures designated by the DSO and approval of the DCB. Records of this inspection and maintenance will be maintained by the DSO and kept in the diver’s file. This requirement also includes back-up regulators and/or alternate air sources.
(b) Regulators suspected or known to be functioning improperly will be immediately inspected and repaired by an authorized repair facility approved by the DCB and/or the DSO.

7.3.8 Timing Devices, Pressure and Depth Gauges
Timing devices and gauges will be inspected and tested before first use, every 12 months thereafter. Additionally, each depth gauge will:
   (a) Be deadweight tested or calibrated against a master reference gauge:
      (1) Every six months, or
      (2) When there is a discrepancy >2% of full scale between any two equivalent gauges.
   (b) Be marked with a label, tag, or sticker, indicating:
      (1) The date of the last calibration and due date that does not obstruct full-scale visibility.
      (2) The amount of deviation (+/-) to the calibration standard.
   (c) Be compared against known standard every six months.
   (d) Have test dates recorded in an equipment log or suitable retrievable manner.

7.3.9 Emergency Equipment
(a) First Aid Kit
   (1) A recommended list of contents will be included with a form for recurring inventory. Re-supply contents after use to ensure effective and timely first aid.
(b) Emergency Oxygen Supply and Delivery System
   (1) Each kit will have cylinders with a unique identity with results of all tests being recorded in the equipment log.
(2) Cylinders will meet the criteria in paragraph 7.1.2 and 7.3.2.
(3) All replacement parts, lubricants, and fittings will be compatible with oxygen.
(4) Will be inspected on a monthly basis for sufficient oxygen cylinder pressure and equipment integrity. When checked out for field use will be checked before every day of diving. Repaired, filled, and replaced as warranted.

7.4 FILL STATION COMPONENTS
All components of a gas fill stations that will contact gas mixtures containing >40% oxygen will be cleaned and maintained for oxygen service. This includes cylinders, whips, gauges, valves, and connecting lines.

7.5 COMPRESSOR SYSTEMS
   (a) TAMUCC Controlled
      1) Requirements
         (i) Have necessary instrumentation to facilitate operations.
         (ii) Have suitable protection around rotating machinery that meets OSHA standard for rotating machinery (29 CFR 1910.219).
         (iii) Be of proper type, pressure, flow rate, and suitable for service intended.
         (iv) Have piping in accordance to ANSI code B31.1.
         (v) Have flexible hoses in accordance to Section 7.1.7 of this standard.
         (vi) Have electrical controls, wiring, and drive units meeting the jurisdictional requirements, when so equipped.
         (vii) Air compressor intakes will be located away from areas containing exhaust gases, fumes, smoke, or other contaminants.
         (viii) Low-pressure compressors used to supply air to the diver if equipped with a volume tank will have a check valve on the inlet side, a pressure gauge, a relief valve, and a drain valve.
         (ix) Compressed air systems >500 psi will have slow-open/close valves.
      2) Testing and Record Keeping
         (i) All equipment will have a unique identity incorporating their manufacturer, model, serial number, maximum rated outlet pressure, rated flow capacity, and safety valve settings.
         (ii) Each modification, repair, test, calibration, and/or maintenance service will be logged, including the date and nature of work performed, and the name of the person performing the work for the following equipment:
             - Compressors.
             - Air storage systems.
             - Air filtration systems.
             - Analytical instruments.
             - Gas control panels.
         (iii) A log will be maintained showing operation, repair, overhaul, filter maintenance, temperature adjustment, and results of all gas analyses, for all university-controlled breathing air compressor apparatus. The results of these tests will be entered in a formal log and maintained in a manner suitable to document their results and accomplishment.
         (iv) Gas analyses
             - Compressors placed in service for an air system will have output tested at regular intervals, not to exceed 100 hours or six months, whichever comes first.
             - Oil-lubricated compressors placed in service for a mixed-gas system will be checked for oil and hydrocarbon contamination at least quarterly.
(v) All equipment will be functionally tested and maintained prior to being put into service, and periodically thereafter in accordance with manufacturers recommendations and planned maintenance schedule.

(b) Commercially Operated

3) Requirements

(i) Breathing air from commercial sources approved by the DCB will be certified by the supplier as suitable for breathing, according to specifications in Section 7.6 or it will be tested before use by university personnel. A vendor’s certification or, a copy of the vendor’s verification of the gas producer’s certification, is required for use of any special gas mix. A copy for each lot will be filed with the DSO.

7.6 **GAS QUALITY STANDARDS**

Breathing air standards will conform to CGA Grade E as set forth by the Compressed Gas Association (ANSI CGA Pamphlet G-7.1-1989) and will contain:

<table>
<thead>
<tr>
<th>Component</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen</td>
<td>20-22%/v</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>≤10 PPM/v</td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>≤1000 PPM/v</td>
</tr>
<tr>
<td>Condensed Hydrocarbons</td>
<td>≤5 mg/m³</td>
</tr>
<tr>
<td>Total Hydrocarbons as Methane</td>
<td>≤25 PPM/v</td>
</tr>
<tr>
<td>Hydrocarbon Contaminants*</td>
<td>≤0.1 mg/m³</td>
</tr>
<tr>
<td>Water Vapor (oil lubrication systems only)</td>
<td>NS</td>
</tr>
<tr>
<td>Objectionable Odors</td>
<td>none</td>
</tr>
</tbody>
</table>

* Will be met for breathing air that is; placed in contact with oxygen concentrations > 40%, or when used to produce gas by partial pressures with gas mixtures containing >40% oxygen as the enriching agent.

For breathing air used in conjunction with self-contained breathing apparatus in extreme cold where moisture can condense and freeze, causing the breathing apparatus to malfunction, a dew point not to exceed -50°F (63 pm v/v) or 10 degrees lower than the coldest temperature expected in the area is required.
Section 8.0

Medical Standards
8.0 MEDICAL STANDARDS

8.1 MEDICAL EXAMINATION CRITERIA

(a) TAMUCC will determine that all divers have passed a current dive physical examination and have been declared by the examining physician to be fit to engage in diving activities as may be limited or restricted in the medical evaluation report.

(b) All medical evaluations will be performed by, or under the direction of, a licensed physician. The physician will be qualified by experience or training for the conduct of diving physical examinations and if not, will consult with another medical practitioner so qualified.

(c) All costs for the physical examination will be the responsibility of the applicant, except in the case of TAMUCC employees who are required to dive as a part of their job activities.

(d) The diver applicant will agree to release the medical information to the DSO and the DCB (Appendix 8.B).

(e) The diver will be free of any chronic disabling disease and conditions contained in the list of conditions for which restrictions from diving are generally recommended (Section 8.3.2 and Appendix 8.A).

8.2 MEDICAL EXAMINATION FREQUENCY

Medical evaluations will be completed as follows:

(a) An initial medical examination is required before a diver may begin diving. A complete initial medical examination will not be required if all of the following criteria are met:
   1) An equivalent medical evaluation has been obtained within the terms outlined below.
   2) No disqualifying conditions subject to this section were found.
   3) TAMUCC has the medical approval of that examination for the diver's file.
   4) The approval has been found satisfactory by the TAMUCC DCB.

(b) Periodic examinations are as follows:
   1) Scientific Divers-in-Training, Scientific Divers, and Temporary Divers
      (i) Less than 40 years of age @ five year intervals
      (ii) 40 years of age and less than 60 @ three year intervals
      (iii) 60 years of age and greater @ two year intervals
   2) Working Divers
      (i) Less than 35 years of age @ one year intervals, a maximum of two years is acceptable.
      (ii) 35 years of age and greater @ one year intervals

(c) Clearance to return to diving will be obtained from a physician following any major injury or illness, or any condition requiring hospital care. If the illness or injury is pressure related, then the clearance to return to diving will come from a physician trained in hyperbaric medicine.

8.3 CONTENT OF MEDICAL EVALUATION

8.3.1 Content of Medical Evaluations

Both Initial and periodic Medical Evaluations will consist of:

(a) Diving Medical Exam Overview for the Examining Physician (Appendix 8.A).
(c) Diving Medical History Form (Appendix 8.C).
(d) Recommended Physicians with Diving Expertise (Appendix 8.D).

8.3.2 Disqualifying Conditions

Conditions that may disqualify a candidate from diving (adapted from Bove, 1998):

(a) Abnormalities of the tympanic membrane, such as perforation, presence of monomeric membrane, or inability to auto-inflate the middle ears.
(b) Vertigo including Meniere's disease.
(c) Stapendectomy and middle ear prosthesis.
(d) Recent ocular surgery.
(e) Psychiatric disorders including, claustrophobia, suicidal ideation, psychosis, anxiety states depression.
(f) Substance abuse, including alcohol.
(g) Episodic loss of consciousness.
(h) History of seizure.
(i) History of stroke or neurological deficit.
(j) Recurring neurological disorders, including transient ischemic attack.
(k) History of intracranial aneurysm, other vascular malformation, or intracranial hemorrhage.
(l) History of neurological decompression sickness with residual deficit.
(m) Head injury with sequelae.
(n) Hematological disorders including coagulopathies.
(o) Evidence of coronary artery disease or high risk for coronary artery disease.
(p) Arterial septal defects.
(q) Significant valvular heart disease – isolated mitral valve prolapse is not disqualifying.
(r) Significant cardiac rhythm or conduction abnormalities.
(s) Implanted cardiac pacemakers and cardiac defibrillators.
(t) Inadequate exercise tolerance.
(u) Severe hypertension.
(v) History of spontaneous or traumatic pneumothorax.
(w) Asthma.
(x) Chronic pulmonary disease, including radiographic evidence of pulmonary blebs, bullae, or cysts.
(y) Diabetes mellitus.
(z) Pregnancy.

8.4 MEDICAL TESTS FOR DIVING

Laboratory and Interval Requirements for Diving Medical Exams are as follows:

<table>
<thead>
<tr>
<th>Laboratory Requirements For Evaluations and Intervals</th>
<th>Scientific Divers</th>
<th>Working Divers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &lt;40 yrs.</td>
<td>5 yrs.</td>
<td>40 - 60 yrs.</td>
</tr>
<tr>
<td>Frequency 3 yrs.</td>
<td>2 yrs.</td>
<td>≥60 yrs.</td>
</tr>
<tr>
<td>Medical History X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Physical, emphasis on neurological/otological components. X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Urinalysis X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Any further tests deemed necessary by the physician. X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Chest X-ray (not required for Scientific Diver Re-examinations, only Working) X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>EKG: standard (12 Leads) X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Coronary Assessment using Multi-Risk Factor Assessment1,2 (age, lipid, blood pressure, diabetic screening, smoker). X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Spirometry X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Audiogram X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Visual Acuity and Color Blindness X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Complete Blood Count (CBC) and Chemistry</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Will include Hematocrit, Hemoglobin, &amp; White Blood Cell count. X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

8.5 Physicians Reports
(a) TAMUCC will provide a copy of the medical evaluation requirements of this standard to the examining physician (Appendix 8.A-B).
(b) After any medical examination relating to the individual’s fitness to dive, the examining physician will provide TAMUCC with a written report containing their opinion of the fitness of the individual to dive, including any recommended restrictions or limitations. The DCB and/or DSO will review the completed medical examination information.
(c) A copy of the physicians report will be available to the individual.

8.6 Medical Records
An accurate medical record for each person subject to the specifications of this section will be maintained. The records will include, at the minimum, a copy of the written report by the physician (Appendix 8.B), and will be kept for five years per OSHA CFR 1910.440(b)(3)(i).
TO THE EXAMINING PHYSICIAN:

Applicant is applying for: _______ Scientific Diving _______ Working Diving
This examination is: _______ Initial exam _______ Re-examination

Their answers on the Diving Medical History Form (Attachment 2) may indicate potential health or safety risks as noted. Your evaluation is requested on the attached Diving Fitness Medical Evaluation Report. If you have questions of a general nature about diving medicine, you may wish to consult one of the references on the attached list or contact one of the physicians with expertise in diving medicine whose names and phone numbers appear on the attachment as well (Attachment 3). Please contact the undersigned Diving Safety Officer if you have any questions or concerns about the Texas A&M University - Corpus Christi dive program or the diving medical standards. Thank you for your assistance.

Diving Safety Officer:
______________________________________________________________
(Print name) _______ (Date) _______ (Signature) _______ (Telephone)

Scuba and other modes of compressed gas diving can be strenuous and hazardous. A special risk is presented if the middle ear, sinuses, or lung segments do not readily equalize pressure changes. The most common cause of distress is Eustachian insufficiency. Most fatalities involve deficiencies in prudence, judgment, emotional stability, or physical fitness. Please consult the following list of conditions that usually restrict candidates from diving (Adapted from Bove, 1998: bracketed numbers are pages in Bove):

- Abnormalities of the tympanic membrane, such as perforation, presence of monomeric membrane, or inability to auto-inflate the middle ears. [5,7,8,9]
- Vertigo including Meniere's disease. [13]
- Stapedectomy and middle ear prosthesis. [11]
- Recent ocular surgery. [15,18,19]
- Psychiatric disorders including, claustrophobia, suicidal ideation, psychosis, anxiety states depression. [20-23]
- Substance abuse, including alcohol. [24-25]
- Episodic loss of consciousness. [1, 26, 27]
- History of seizure. [27-28]
- History of stroke or neurological deficit. [29-30]
- Recurring neurologic disorders, including transient ischemic attack. [29-30]
- History of intracranial aneurysm, other vascular malformation, or intracranial hemorrhage. [31]
- History of neurological decompression sickness with residual deficit. 29-30
- Head injury with sequelae. [26-27]
- Hematological disorders including coagulopathies. [41-42]
- Evidence of coronary artery disease or high risk for coronary artery disease. [33-35]
- Arterial septal defects. [39]
- Significant valvular heart disease – isolated mitral valve prolapse is not disqualifying. [38]
- Significant cardiac rhythm or conduction abnormalities. [36-37]
- Implanted cardiac pacemakers and cardiac defibrillators (ICD). [39-40]
- Inadequate exercise tolerance. [34]
- Severe hypertension. [35]
- History of spontaneous or traumatic pneumothorax. [45]
- Asthma. [42-44]
- Chronic pulmonary disease, including radiographic evidence of pulmonary blebs, bullae, or cysts. [45-46]
- Diabetes mellitus. [46-47]
- Pregnancy. [56]
SELECTED REFERENCES IN DIVING MEDICINE
Available from Best Publishing Company, P.O. Box 30100, Flagstaff, AZ 86003-0100, the Divers Alert Network (DAN) or the Undersea and Hyperbaric Medical Society (UHMS), Durham, NC


# Appendix 8.B
## Medical Evaluation Report of Fitness for Diving

Name of Applicant (Print/Type)  
Date (Day/Month/Year)  

TO THE PHYSICIAN:  
This person is an applicant for training or is presently certified to engage in diving with self-contained underwater breathing apparatus (scuba). This activity puts unusual stress on the individual in several ways. Your opinion of the applicant's medical fitness is requested. Scuba diving requires heavy exertion. The diver will be free of cardiovascular and respiratory disease. An absolute requirement is the ability of the lungs, middle ear, and sinuses to equalize pressure. Any condition that risks the loss of consciousness will disqualify the applicant.

TESTS:  
Please initial that the following tests were completed.  
All Initial and Periodic Re-examination tests are to be completed in their entirety. If they fall between the Initial and Periodic Re-examinations the extent of tests and lab requirements are to be at the discretion of the examining physician and are to be at a level equal to that of basic annual health maintenance physical. Please check tests performed.

<table>
<thead>
<tr>
<th>Laboratory Requirements For Evaluations and Intervals</th>
<th>Scientific Divers</th>
<th>Working Divers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&lt;40</td>
<td>&gt;60</td>
</tr>
<tr>
<td>Frequency</td>
<td>5 yrs.</td>
<td>3 yrs.</td>
</tr>
<tr>
<td>Medical History</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Physical, emphasis on neurological/otological components</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Urinalysis</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Any further tests deemed necessary by the physician.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Chest X-ray (NOTE: not required for Scientific Diver Re-examinations, only Working Divers)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>EKG: standard (12 Leads)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Coronary Assessment using Multi-Risk Factor Assessment</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(age, lipid, blood pressure, diabetic screening, smoker)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Spirometry</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Audiogram</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Visual Acuity and Color Blindness</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Complete Blood Count (CBC) and Chemistry</td>
<td></td>
<td></td>
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<tr>
<td>Will include Hematocrit, Hemoglobin, &amp; White Blood Cell count.</td>
<td></td>
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</tr>
</tbody>
</table>

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PHYSICIANS STATEMENT:

_____ Diver IS medically qualified to dive on:  

Scientific status for:

2 years (over age 60)
3 years (age 40-59)
5 years (under age 40)

Working status for:

2 years (under age 35)
1 year (over age 35)

_____ Diver IS NOT medically qualified to dive:  

Permanently
Temporarily

REMARKS:

I have evaluated the abovementioned individual according to the American Academy of Underwater Sciences medical standards and required tests for scientific diving (Sec. 6.00 and Appendix 1) and, in my opinion, find no medical conditions that may be disqualifying for participation in scuba diving. I have discussed with the patient any medical condition(s) that would not disqualify them from diving but which may seriously compromise subsequent health. The patient understands the nature of the hazards and the risks involved in diving with these conditions.

M.D.

Signature

Name (Print/Type)

Address

Telephone Number

Date (month/day/year)

My familiarity with applicant is:  

This exam only
Regular physician
Number of years.

Other (describe):

My familiarity with diving medicine is:

APPLICANT’S RELEASE OF MEDICAL INFORMATION FORM

Name of Applicant (print or type)

I authorize the release of this information and all medical information subsequently acquired in association with my diving to Texas A&M University - Corpus Christi’s Diving Safety Officer and Diving Control Board, or designee.

Signature of Applicant

Date (Day/Month/Year)
TO THE APPLICANT

Diving makes considerable demands on your physical and emotional condition. Diving with certain medical conditions may be asking for trouble, not only for yourself but also for anyone coming to your aid if you get into difficulty in the water. Therefore, it is prudent to meet certain medical and physical requirements before beginning a diving or training program.

Your answers to the questions are as important, in many instances, in determining your fitness as what the physician may see, hear, or feel when you are examined. Obviously, you will give accurate information or the medical screening procedure becomes useless.

This form will be kept confidential. If you believe any question(s) amounts to invasion of your privacy, you may elect to omit an answer, provided you discuss the matter with the physician; and they will then indicate, in writing, that you have done so and that no health hazard exists.

If your answers indicate a condition(s) that might make diving hazardous, you will be asked to review the matter with your physician. In such instances, their written authorization will be required in order for further consideration to be given your application. If your physician concludes that diving would involve undue risk for you, remember that they are concerned only with your well-being and safety. Respect this advice and the intent of this medical history form.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Please indicate whether or not the following apply to you</th>
<th>Comments</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td>Convulsions, seizures, or epilepsy</td>
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<td>2</td>
<td></td>
<td>Fainting spells or dizziness</td>
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<td>3</td>
<td></td>
<td>Been addicted to drugs</td>
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<td>4</td>
<td></td>
<td>Diabetes</td>
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<td>5</td>
<td></td>
<td>Motion sickness or sea/air sickness</td>
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<td>6</td>
<td></td>
<td>Claustrophobia</td>
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<td>7</td>
<td></td>
<td>Mental disorder or nervous breakdown</td>
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<td>8</td>
<td></td>
<td>Are you pregnant?</td>
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<td>9</td>
<td></td>
<td>Do you suffer from menstrual problems?</td>
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<td>10</td>
<td></td>
<td>Anxiety spells or hyperventilation</td>
<td></td>
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<tr>
<td>11</td>
<td></td>
<td>Frequent sour stomach, nervous stomach, or vomiting spells</td>
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<tr>
<td>12</td>
<td></td>
<td>Had a major operation</td>
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<td>13</td>
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<td>Presently being treated by a physician</td>
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<tr>
<td>14</td>
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<td></td>
<td>Taking any medication regularly (even non-prescription)</td>
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<td>15</td>
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<td>Been rejected or restricted from sports</td>
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<td>16</td>
<td></td>
<td></td>
<td>Headaches (frequent and severe)</td>
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<td>17</td>
<td></td>
<td></td>
<td>Wear dental plates</td>
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<td>18</td>
<td></td>
<td></td>
<td>Wear glasses or contact lenses</td>
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<tr>
<td>19</td>
<td></td>
<td></td>
<td>Bleeding disorders</td>
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<td>20</td>
<td></td>
<td></td>
<td>Alcoholism</td>
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<tr>
<td>21</td>
<td></td>
<td></td>
<td>Any problems related to diving</td>
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<td>22</td>
<td></td>
<td></td>
<td>Nervous tension or emotional problems</td>
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<tr>
<td>23</td>
<td></td>
<td></td>
<td>Take tranquilizers</td>
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<tr>
<td>24</td>
<td></td>
<td></td>
<td>Perforated ear drums</td>
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<tr>
<td>25</td>
<td></td>
<td></td>
<td>Hay fever</td>
</tr>
<tr>
<td>26</td>
<td></td>
<td></td>
<td>Frequent sinus trouble, drainage from the nose, post-nasal drip, or stuffy nose</td>
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<tr>
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<td>Frequent earaches</td>
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<td></td>
<td></td>
<td>Drainage from the ears</td>
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<tr>
<td>29</td>
<td></td>
<td></td>
<td>Difficulty with your ears in airplanes or on mountains</td>
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<tr>
<td>30</td>
<td></td>
<td></td>
<td>Ear surgery</td>
</tr>
<tr>
<td>31</td>
<td></td>
<td></td>
<td>Ringing in your ears</td>
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<td>32</td>
<td></td>
<td></td>
<td>Frequent dizzy spells</td>
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<td></td>
<td>Hearing problems</td>
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<tr>
<td>34</td>
<td></td>
<td></td>
<td>Trouble equalizing pressure in your ears</td>
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<td>35</td>
<td></td>
<td></td>
<td>Asthma</td>
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<tr>
<td>36</td>
<td></td>
<td></td>
<td>Wheezing attacks</td>
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<td>37</td>
<td></td>
<td></td>
<td>Cough (chronic or recurrent)</td>
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<tr>
<td>38</td>
<td></td>
<td></td>
<td>Frequently raise sputum</td>
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<tr>
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<td>Pleurisy</td>
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<td>Collapsed lung (pneumothorax)</td>
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<td>41</td>
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<td>Lung cysts</td>
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<td>Please indicate whether or not the following apply to you</td>
<td>Comments</td>
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<tr>
<td>42</td>
<td>No</td>
<td>Pneumonia</td>
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<td>43</td>
<td>No</td>
<td>Tuberculosis</td>
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<td>44</td>
<td>No</td>
<td>Shortness of breath</td>
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<td>45</td>
<td>No</td>
<td>Lung problem or abnormality</td>
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<td>46</td>
<td>No</td>
<td>Spit blood</td>
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<td>47</td>
<td>No</td>
<td>Breathing difficulty after eating particular foods, after exposure to particular pollens or animals</td>
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<tr>
<td>48</td>
<td>No</td>
<td>Are you subject to bronchitis</td>
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<tr>
<td>49</td>
<td>No</td>
<td>Subcutaneous emphysema (air under the skin)</td>
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<tr>
<td>50</td>
<td>No</td>
<td>Air embolism after diving</td>
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<tr>
<td>51</td>
<td>No</td>
<td>Decompression sickness</td>
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<td>52</td>
<td>No</td>
<td>Rheumatic fever</td>
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</tr>
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<td>53</td>
<td>No</td>
<td>Scarlet fever</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>No</td>
<td>Heart murmur</td>
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</tr>
<tr>
<td>55</td>
<td>No</td>
<td>Large heart</td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>No</td>
<td>High blood pressure</td>
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<tr>
<td>57</td>
<td>No</td>
<td>Angina (heart pains or pressure in the chest)</td>
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<tr>
<td>58</td>
<td>No</td>
<td>Heart attack</td>
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<tr>
<td>59</td>
<td>No</td>
<td>Low blood pressure</td>
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</tr>
<tr>
<td>60</td>
<td>No</td>
<td>Recurrent or persistent swelling of the legs</td>
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</tr>
<tr>
<td>61</td>
<td>No</td>
<td>Pounding, rapid heartbeat or palpitations</td>
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<tr>
<td>62</td>
<td>No</td>
<td>Easily fatigued or short of breath</td>
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</tr>
<tr>
<td>63</td>
<td>No</td>
<td>Abnormal EKG</td>
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<td>64</td>
<td>No</td>
<td>Joint problems, dislocations or arthritis</td>
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<td>65</td>
<td>No</td>
<td>Back trouble or back injuries</td>
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</tr>
<tr>
<td>66</td>
<td>No</td>
<td>Ruptured or slipped disk</td>
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<td>67</td>
<td>No</td>
<td>Limiting physical handicaps</td>
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<td>68</td>
<td>No</td>
<td>Muscle cramps</td>
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<td>69</td>
<td>No</td>
<td>Varicose veins</td>
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<tr>
<td>Yes</td>
<td>No</td>
<td>Please indicate whether or not the following apply to you</td>
<td>Comments</td>
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<tr>
<td>70</td>
<td></td>
<td>Amputations</td>
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<tr>
<td>71</td>
<td></td>
<td>Head injury causing unconsciousness</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td></td>
<td>Paralysis</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td></td>
<td>Have you ever had an adverse reaction to medication?</td>
<td></td>
</tr>
<tr>
<td>74</td>
<td></td>
<td>Do you smoke?</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td></td>
<td>Have you ever had other medical problems not listed? If so, please list or describe below:</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td></td>
<td>Is there a family history of high cholesterol?</td>
<td></td>
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<tr>
<td>77</td>
<td></td>
<td>Is there a family history of heart disease or stroke?</td>
<td></td>
</tr>
<tr>
<td>78</td>
<td></td>
<td>Is there a family history of diabetes?</td>
<td></td>
</tr>
<tr>
<td>79</td>
<td></td>
<td>Is there a family history of asthma?</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td></td>
<td>Date of last tetanus shot? Vaccination dates?</td>
<td></td>
</tr>
</tbody>
</table>

Please explain “yes” to any of the above questions.

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

I certify that the above answers and information represent an accurate and complete description of my medical history.

Applicants Name (Print/Type)

__________________________________________________________________________

Signature of Applicant (Print/Type)          Date (Day/Month/Year)
APPENDIX 8.D

RECOMMENDED PHYSICIANS WITH DIVING MEDICINE EXPERTISE

Divers Alert Network
Duke University Medical Center
P.O. Box 3823
Durham, North Carolina 27710
OFFICE: 919-684-2948

Dr. Collette Simon
CHRISTUS Spohn Hospital, Corpus Christi – Shoreline
600 Elizabeth Street, 2nd Floor (Attn: Wound Care Center)
Corpus Christi, Texas 78404
361.861.9686 phone
361.881.3617 fax
Section 9.0

Emergency Procedures
9.0 **EMERGENCY PROCEDURES**

9.1 **DIVER TREATMENT PROCEDURES**

The following treatment procedures are minimum guidelines, as outlined by the organizational standards referenced in Section 1.2.2 and 1.2.3, to assist with the first aid and treatment of a diver with an injury. The following are in no order of preference as each emergency will dictate its own priorities. Modifications may be necessary for each diving application.

**NOTE:** Refer to the Dive Plan of the particular dive operation for emergency contact listings (Appendix 4.B). For medical consultation information, refer to the Advisors to the TAMUCC DCB in pretext or Diving Physicians list, Appendix 8.D.

(a) Minor Injuries – can be treated by qualified university personnel without the assistance of non-university medical professionals.

1) Administer first aid treatment as necessary.
2) Notify appropriate TAMUCC personnel so incident reports may be filed accordingly (Section 10.0).

(b) Major Injuries – require assistance from non-university medical professionals may be separated into three categories:

1) Pressure Related Accidents - require recompression (pressure related accidents, e.g. air-embolism or bends).
   
   (i) Establish (C)irculation, (A)irway, and (B)reathing – supplement with oxygen.
   (ii) Continue oxygen administration.
   (iii) Activate EMS or contact Coast Guard (VHF Channel 16 or telephone Regional Rescue Coordination Center, New Orleans (504) 589-6225) and arrange to have the victim and person administering the first aid treatment picked up and transported to the nearest hyperbaric facility.
   (iv) If Coast Guard cannot provide transportation, request a call to 911(EMS) be made to have an ambulance waiting at nearest dock site.
   (v) Perform secondary assessment; administer first aid as needed.
   (vi) Monitor until EMS arrives or victim is evacuated.
   (vii) DPIC/Lead files accident report.
   (viii) Information needed by chamber personnel when requesting assistance:
   - Victim conscious or unconscious?
   - Do symptoms indicate air embolism or decompression sickness (bends)?
   - Victim arriving by automobile, ambulance, or helicopter? If automobile, give make, model, and license plate number.
   - Victim’s full name, age, sex, social security number, dive profile and estimated time of arrival.
   - Give your name and victim's emergency contact information.

2) Injuries and Severe Wounds – require first aid and immediate transportation of the injured person to a hospital.

   (i) Establish (C)irculation, (A)irway, and (B)reathing – supplement with oxygen.
   (ii) Perform Secondary Assessment and administer first aid. Continue oxygen administration as needed.
   (iii) Contact EMS or contact Coast Guard (VHF Channel 16 or telephone Regional Rescue Coordination Center, New Orleans (504) 589-6225) and arrange for transportation to hospital.
   (iv) Continue first aid and treat for shock. Monitor until EMS arrives or victim is evacuated.
   (v) DPIC/Lead files accident report.
3) **Near Drowning** - requires immediate first aid and summoning of medical personnel to the injured person (near-drowning or suspected cervical spinal damage).
   
   (i) Establish **Circulation**, (A)irway, and (B)reathing—supplement with oxygen.
   
   (ii) Contact EMS or radio Coast Guard and arrange for transportation to hospital.
   
   (iii) If Coast Guard is unable to provide transportation, request that a call to 911(EMS) be made to have an ambulance waiting at the nearest dock site.
   
   (iv) Continue application of artificial respiration and CPR supplemented with oxygen until relieved by professional medical personnel.
   
   (v) In case of suspected cervical spinal injury, stabilize victim using accepted treatment procedures and transport with as little movement as possible to a point where pre-summoned EMS personnel can treat and transport victim to the Emergency Room.
   
   (vi) **DPIC/Lead files accident report.**

### 9.2 **Dive Operation Procedures**

The following emergency procedures are minimum guidelines to assist with the development of specific Dive Plans. The following are in no order of preference as each emergency will dictate its own priorities. Modifications may be necessary for each diving application.

With any dive emergency, immediately abort ALL TAMUCC dive operations and bring divers to surface immediately and within the confines of a safe ascent. Diving will not resume until the cause has been fully remedied.

(a) **Loss of Breathing Media**
   1) Re-establish media supply by:
      
      (i) Activating topside secondary breathing supply, or
      
      (ii) Diver switches to diver-carried reserve-breathing supply.
   
   2) Alert Standby Diver.
   
   3) Diver proceeds to down-line.
   
   4) If required, send Standby Diver to diver’s assistance.
   
   5) Terminate dive.

(b) **Loss of Communications**
   1) Attempt to establish line-pull signals.
   
   2) Alert Standby Diver.
   
   3) Diver proceeds to down-line.
   
   4) Bring diver to first stop once line pull signals are established.
   
   5) If (unable to establish any form of communication with diver, send Standby Diver to diver’s assistance prior to bringing to diver’s first stop.
   
   6) Terminate dive.

(c) **Fouled or Entrapped Diver**
   1) Diver informs topside.
   
   2) Have the diver avoid panic and ensure s/he do not begin ditching equipment.
   
   3) Alert Standby Diver.
   
   4) Diver determines extent of entrapment.
   
   5) Diver attempts to free himself.
   
   6) If required, send Standby Diver to diver’s assistance.
   
   7) When diver is free, if unable or unwilling to continue the dive, or if Standby Diver was required to enter water for assistance, terminate dive.

(d) **Injured Diver in Water**
   1) Diver informs topside and dive is aborted.
   
   2) Alert Standby Diver.
   
   3) Diver determines nature and extent of injury.
4) If required, send in Standby Diver down to assist diver, administer first aid, and evaluate injury. Standby Diver will remain with diver.
5) Request medical assistance and emergency evacuation (if required).
6) Monitor breathing. If breathing stops, overpressure divers regulator if possible.

(e) Severance of Diver’s Umbilical—Gas Hose Only
1) Diver activates reserve-breathing supply.
2) Alert Standby Diver.
3) Diver returns to down-line.
4) Terminate dive and follow proper ascent procedures.
5) If required send Standby Diver down with additional reserve breathing supply or hose.

(f) Severance of Diver’s Umbilical—Complete
1) Diver activates reserve-breathing supply.
2) Alert Standby Diver.
3) Diver return to down-line.
4) If umbilical severed on deck and the end of the umbilical is still on deck, send Standby Diver down umbilical with new hose or reserve breathing gas supply. Otherwise, send Standby Diver down down-line.
5) Terminate dive and begin proper ascent procedures.

(g) Fire in Equipment
1) Extinguish fire; secure equipment.
2) Determine damage and effect on diver.
3) If required, terminate dive; commence proper ascent procedures.

(h) Equipment Failure – Diver in Water
1) Evaluate effect on diver.
2) Inform diver of problem and action planned.
3) Alert Standby Diver.
4) Alert deck crew.
5) Diver informs topside of their readiness.
6) Active plan, terminate dive.

(i) Oxygen Toxicity
1) DPIC/Lead notes signs or diver reports symptoms to topside.
2) Dive is aborted.
3) Reduce diver’s oxygen partial pressure (e.g. switch to air or lower PPO2 gas.)
4) Continue proper ascent procedures.

(j) Oxygen Toxicity During Treatment/Stop
1) Diver reports to topside.
2) Have diver reduce O2 partial pressure (switch to air) for 15 minutes. When symptoms disappear, continue ascent on previous gas mixture. Do not count time on the lower PPO2 gas.
3) If toxicity symptoms occur a second time, repeat PPO2 reduction of 15 minutes.
4) If toxicity symptoms occur a third time, discontinue oxygen treatment and immediately request advice and assistance from designated point of contact.

(k) Emergency Evacuation
1) Notify Diver and all surrounding personnel of emergency and terminate dive.
2) Have diver begin ascent following proper procedure. If not possible, follow omitted decompression procedures.
3) Evacuate all unnecessary personnel to safe platform.
4) Contact management and inform them of conditions as soon as possible.
Section 10.0

Accident Reporting
10.0 INCIDENT REPORTS

All TAMUCC diving illnesses and accidents will be recorded specifying the circumstances of the incident and the extent of the injuries or illness. All diving illnesses and accidents will be reported to the DCB. TAMUCC will report all illnesses and accidents in accordance with requirements of the appropriate Labor Code and Organizations of which TAMUCC is a member, e.g. 46 CFR – Department of Transportation – Coast Guard, 29 CFR – Department of Labor – Occupational Safety and Health Administration, and Standards for Scientific Diving – American Academy of Underwater Sciences.

10.1 SPECIFIC REPORTING REQUIREMENTS

10.1.1 46 CFR – Department of Transportation – Coast Guard

Subchapter V-Marine Occupational Safety and Health Standards, Part § 197.484, requires the DPIC to notify the Officer in Charge, Marine Inspection, as soon as possible after a diving casualty occurs, if the casualty involves any of the following:

(a) Loss of Life.
(b) Diving-related injury to any person causing incapacitation for more than 72 hours.
(c) Diving-related injury to any person requiring hospitalization for more than 24 hours.

Part § 197.486 define the form of the written report of casualty and require:

(a) That a report be furnished on Form CG-2692 when the diving installation is on a vessel or,
(b) That a written report, in narrative form, be used when the diving installation is on a facility.

In either instance, the report will furnish the following information:

(a) Name and official number (if applicable) of the vessel or facility.
(b) Name and owner agent of the vessel of facility.
(c) Name of the DPIC.
(d) Name of the Lead.
(e) Description of the casualty including presumed cause.
(f) Nature and extent of the injury to persons.

10.1.2 29 CFR – Department of Labor – OSHA

Subpart T – Commercial Diving Operations, § 1910.440, requires the employer 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 illness.

In May 1994, OSHA further clarified and defined the reporting requirements to state: Employers are required to orally report any occupational fatality or catastrophe involving in-patient hospitalization of three or more workers within eight hours per 29 CFR § 1910.8. The report will include the following information:

(a) Company Name.
(b) Location and time of incident.
(c) Number of fatalities or hospitalized employees.
(d) Contact person for the company.
(e) Phone number(s) for the company contact person.
(f) Brief description of the incident.

10.1.3 Standard for Scientific Diving – AAUS

Per AAUS, all diving related incidents requiring recompression treatment, or resulting in moderate to serious injury, or death will be reported. The report will specify the circumstances of the incident and the extent of any injuries or illnesses.

If the incident was pressure-related, suspected, or if any symptoms are evident, the TAMUCC Incident Report will also contain the following additional information and be retained by TAMUCC, with the record of the dive as outlined in Section 6.6:
(a) Competed AAUS Incident Report Form found at http://www.aaus.org.
(b) Written descriptive report containing:
   (1) Name, address, and phone number(s) of principal parties involved.
   (2) Summary of experience of the divers involved.
   (3) Location and description of the dive site, and conditions leading to the incident.
   (4) Description of symptoms, including depths and time of onset.
   (5) Description and results of treatment.
   (6) Disposition of case.
(c) A decompression procedure assessment in which TAMUCC’s DCB will:
   (1) Investigate and evaluate the pressure related sickness, based on recorded information, consideration of previous pressure related injuries, tables used, and individual susceptibility.
   (2) Take appropriate corrective action to reduce the probability of recurrence of similar pressure related injuries.
   (3) Prepare a written evaluation of the procedure assessment, including any corrective action taken, within 45 days of the incident.
   (4) Forward a copy to AAUS during the annual reporting cycle.
APPENDIX 10.A
INCIDENT AND ACCIDENT FORM

Incident Reporting: All diving related incidents requiring recompression treatment, or resulting in moderate or serious injury, or death will be reported to the Texas A&M University - Corpus Christi Diving Control Board. The report will specify the circumstances of the incident and the extent of any injuries or illnesses. This form is confidential and for information purposes only. Texas A&M University - Corpus Christi’s Diving Control Board will review and approve the release of this report before it may be submitted to other entities.

VICTIM INFORMATION
Name: ____________________________________________
Address: ____________________________________________
Home Phone Number: ____________________________ Work Phone Number: ____________________________
Gender: (M) (F) Marital Status: (S) (M) Height: ________ Weight: ________
Certified Diver: (Y) (N) If yes, what Agency? ______________________________________________________________________
Level of Dive Certification: ____________________________ Occupation: ____________________________
Date of Incident: ____________________________ Time of Incident: ____________________________

PERSON MAKING REPORT
Name: ____________________________________________
Address: ____________________________________________
Home Phone Number: ____________________________ Work Phone Number: ____________________________
Did you witness the incident? (Y) (N) Are you a certified diver? (Y) (N)
Level of Dive Certification: ____________________________ Agency: ____________________________
Relationship to accident victim: ______________________________________________________________________

LEAD DIVER INFORMATION
Name: ____________________________________________
Address: ____________________________________________
Home Phone Number: ____________________________ Work Phone Number: ____________________________
Level of Dive Certification: ____________________________ Agency: ____________________________
Diver Insurance Company: ______________________________________________________________________
WITNESS INFORMATION
If witness statements are taken, they will provide only facts, no opinions. Have witness date and sign each page of statement. Attach copies to this report.

<table>
<thead>
<tr>
<th>NAME</th>
<th>ADDRESS</th>
<th>PHONE NUMBER</th>
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GENERAL INFORMATION
Type of incident (non-injury, bodily, fatality):

Diving activity at the time of incident:

Victim was (Scuba diving, snorkeling, other):

Describe the location by state, country, and nearest geographic location:

Was there any apparent panic by victim?

Victim was recovered where (on or below surface, if below provide depth):

Length of time from incident to recovery of victim:

Who made the rescue/recovery?

Was rescue breathing attempted? YES NO Was CPR attempted? YES NO

Was oxygen provided to victim? YES NO If yes, by whom?

Were emergency medical services used? YES NO If yes, what agency:

Was victim transported to medical facility YES NO If yes, what facility:

Did victim receive recompression treatment? YES NO If yes, what facility:

Please attach any waivers, releases, or statements of understanding signed by victim. If the accident took place during training or working phase, please attach copies of pertinent records of training. If possible, attach a copy of victim’s dive logs.

VICTIM’S EQUIPMENT
Of the following items, provide information as it applies (brand, model, etc.):

Mask:

Fins:

Snorkel:

Regulator:

BC Type:

Thermal Protection:

SPG:

Depth Gauge:

Back-up Regulator:

Weight System: Amount
**TAMUCC Diving Standards for Underwater Operations**

<table>
<thead>
<tr>
<th>Tank System Mask:</th>
<th>Size(s)</th>
<th>Type(s)</th>
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<th>Surface Float type:</th>
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<th>Underwater Light:</th>
<th>Type</th>
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<td>YES</td>
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<td>NO</td>
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<tr>
<th>Dive Computer:</th>
<th>Type (console, wrist mount)</th>
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<tr>
<td>YES</td>
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<td>NO</td>
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<th>Other Equipment:</th>
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<tr>
<th>Were there apparent equipment problems?</th>
<th>YES</th>
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<tr>
<th>Was equipment rented?</th>
<th>YES</th>
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<th>Amount of air in cylinder:</th>
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<th>Current location of equipment:</th>
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<tr>
<th>Is equipment being tested?</th>
<th>YES</th>
<th>NO</th>
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**DIVING INFORMATION:**

<table>
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<th>Mode of entrance (Shore, Boat, other):</th>
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<th>Incident occurred (on or below surface, if below provide depth):</th>
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<tr>
<th>Water Conditions (calm, rough):</th>
<th>Wave Height</th>
<th>Water Temp:</th>
<th>Visibility:</th>
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<tr>
<th>Victim alone, with buddy?</th>
<th>Buddy Contact Broken?</th>
<th>Entangled (explain)?</th>
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<th>Explain:</th>
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<tr>
<th>Task/type of dive (deep, current, wreck, boat, night, collection, photography):</th>
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<tr>
<th>Finally, include a brief narrative description (Attach separate sheet providing only facts and no opinions). Include a list of emergency services or other agencies known to have taken reports etc.</th>
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<tr>
<th>Name (Print/Type)</th>
<th>Date of Report (Day/Month/Year)</th>
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Signature
Section 11.0

Department of Labor:  
Occupational Safety and Health Administration  
COMMERCIAL DIVING STANDARD
11.0 CFR 1910 - OCCUPATIONAL SAFETY AND HEALTH STANDARDS

Sub-part T—Commercial Diving Operations

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1910.402 Definitions

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1910.410 Qualification of Dive Team

OPERATIONS PROCEEDURES
1910.421 Pre-dive Procedures
1910.422 Procedures During Dive
1910.423 Post Dive Procedures

SPECIFIC OPERATIONS PROCEDURES
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EQUIPMENT PROCEDURES AND REQUIREMENTS
1910.430 Equipment

RECORDKEEPING
1910.440 Record keeping requirements
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APPENDIX A
Appendix A to 1910 Subpart T

APPENDIX B
Appendix B to 1910 Subpart T

1910 Subpart T-Commercial Diving Operations

Authority: Sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); sec. 107, Contract Work Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); sec. 41, Longshoreman and Harbor Workers’ Compensation Act (33 U.S.C. 941); Secretary of Labor's Order No. 12-71 (36 FR 87540); 8-76 (41 FR 25059); 9-83 (48 FR 35736), or 1-90 (55 FR 9033), as applicable; and 29 CFR part 1911.

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

[58 FR 35310, June 30, 1993; 61 FR 9227, March 7, 1996]

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 employment, including general industry, construction, ship repairing, shipbuilding, ship breaking and Long-shoring. 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 (* see additional guidelines outlined in Appendix B of 1910 Subpart T, page 22):

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

Employer obligation to prevent or minimize a situation which is likely to cause death, serious physical harm, or major environmental damage, provided that the employer:

(a) 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

(b) 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.


1910.402 Definitions

(a) 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 un-pressurized (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 decompression 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 that 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 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 that 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 that 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.

In-water stage - A suspended underwater platform that supports a diver in the water.

Live-boarding - The practice of supporting a surfaced-supplied air or mixed-gas diver from a vessel that is underway.

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

No-decompression limits (NDL) - 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 that the employer can demonstrate to be equally effective.

PSI (g) - Pounds per square inch (gauge).

Scientific diving - 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 gas diving - A diving mode in which the diver in the water is supplied from the dive location with compressed gas 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.


### 1910.410 Qualification 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 limited additional tasks may be assigned to an employee undergoing training if 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 shall, 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 that 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.


**a** General. The employer shall develop and maintain a safe practices manual that 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 that 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 that 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 that 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 shall not support combustion.

(h) Explosives
1910.423 Post Dive Procedures

(a) General. The employer shall comply with the following requirements that 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 (six 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 the following:
   (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 view-port; 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.


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 in-water decompression time >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 in-water 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 >220 fsw or when the dive involves in-water decompression time of >120 minutes, except when heavy gear is worn or when diving in physically confining spaces; or
(i) A closed bell is used at depths >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 in-water stage shall be provided to divers in the water.
(7) An in-water 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 Live-boating
(a) General. Employers engaged in diving operations involving Live-boating shall comply with the following requirements.
(b) Limits. Diving operations involving Live-boating shall not be conducted:
   (1) With an in-water decompression time of >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 >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 Live-boating operations.

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) >20 p/m;
      (ii) A level of carbon dioxide (CO₂) >1,000 ppm;
      (iii) A level of oil mist >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 four 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) Umbilical's 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, when used on a manifold, 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% 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 that can be read at the dive site 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 >2% 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 site.

(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 >40% by volume oxygen shall be designed for oxygen service.
   (2) Components (except umbilicals) exposed to oxygen or mixtures containing >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.
1910.440 Record keeping requirements

(a)(1) Reserved

(2) The employer shall record the occurrence of any diving-related injury or illness that 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 that 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 that 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, and response to therapy, number of occurrences, diving mode, or degree and duration of isolation.

1. History of seizure disorders other than early febrile convulsions.
2. Malignancies (active) unless treated and without recurrence for 5 yrs.
3. Chronic inability to equalize sinus and/or middle ear pressure.
4. Cystic or cavitary disease of the lungs.
5. Impaired organ function caused by alcohol or drug use.
6. Conditions requiring continuous medication for control (e.g., antihistamines, steroids, barbiturates, mood altering drugs, or insulin).
7. Meniere’s disease.
8. Hemoglobinopathies.
9. Obstructive or restrictive lung disease.
10. Vestibular end organ destruction.
11. Pneumothorax.
12. 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).
Appendix B to 1910 Subpart T

This appendix contains guidelines that shall be used in conjunction with 1910.401(a)(2)(iv) to determine those scientific diving programs that 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.

[50 FR 1050, Jan. 9, 1985]
Section 12.0

Glossary
12.0 **GLOSSARY**

**Actual Cubic Feet per Minute (ACFM)**
The actual volume of a gas supplied to a diver, bell, etc. at ambient pressure.

**Ambient Pressure**
The surrounding pressure at depth (actual or simulated) to which the diver, etc. is subjected.

**Air Sharing**
Sharing of an air supply between divers.

**Air**
A naturally occurring gas mixture comprising approximately four-fifths nitrogen, one-fifth oxygen, and various trace gases.

**Appropriate Breathing Mix**
A breathing mixture which, having regard to the system and equipment used in the dive operations, the work undertaken in those operations, and the conditions in which and the depth at which they are to be carried out, is suitable in content and temperature and of adequate depth. Per TAMUCC regulations, will be defined as having an Equivalent Air Depth (EAD) of 130 feet and a Partial Pressure of Oxygen (PPO2) no greater than 1.6 (resting) at Maximum Operating Depth (MOD).

**Ascent Time**
The time interval between leaving the bottom when the dive is terminated and reaching the surface.

**ASME Code or equivalent**
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.

**Atmospheres Absolute (ATA)**
Total pressure exerted on an object at a specific depth or elevation. In diving, the sum of barometric pressure and hydrostatic pressure.

**Bailout**
An emergency where a diver leaves bottom and comes directly to the surface, exceeding normal controlled ascent rates and missing scheduled decompression water stops.

**Bailout Bottle**
See Diver-Carried Reserve Breathing Gas.

**Bell**
An enclosed compartment, pressurized (closed bell) or un-pressurized (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.

**Bends**
See Decompression Sickness.

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

**Breath-hold Diving**
A diving mode in which a diver is subject to a hyperbaric environment while using no self-contained or surface-supplied gas supply.

**Breathing System**
Device or apparatus for delivering breathing gas mixture.

**Buddy Breathing**
The sharing of a single gas source between divers.

**Buddy System**
Comparably equipped scuba divers in the water in constant communication.
Buoyant Ascent
An ascent made using some form of positive buoyancy.

Burst pressure
The pressure at which a pressure containment device will structurally fail.

Certified Diver
A diver who holds a valid certification from a recognized certifying agency. If diving under university auspices, a diver who holds a TAMUCC certification or is certified by another AAUS Organizational Member.

Cleaned for Oxygen Service
Cleaning of equipment or system to ensure elimination of all hydrocarbons and other potentially dangerous contaminants when system will be used in oxygen service. See also Oxygen Cleaning.

CNS
Central Nervous System

Confined Space
Any space which would restrict the diver’s ability to rotate himself head to toe, 180° degrees in any plane and/or when the diver has no direct access to the surface.

Compressor
A machine that raise air or other gasses to a pressure above one atmosphere.

Controlled Ascent
Any one of several kinds of ascents including normal, swimming, and buddy breathing ascents where the diver(s) maintain control so a pause or stop can be made during the ascent.

CPR
Cardio-Pulmonary Resuscitation. A combination of artificial respiration and artificial circulation.

Cylinder
A pressure vessel for the storage of gases.

DAN
The Divers Alert Network, affiliated with the Duke University Medical Center, Durham, North Carolina.

Decompression
Releasing from pressure or compression following a specific decompression table or procedure during ascent: ascending in the water or experiencing decreased pressure in the chamber.

Decompression Chamber
A pressure vessel for human occupancy. Also called a hyperbaric chamber or recompression chamber.

Decompression Schedule
A time-depth profile with a specific bottom time and depth, whose application is calculated to reduce the pressure on a diver safely.

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

Decompression Table
A set of decompression schedules computed on a common protocol.

Designated Person in Charge (DPIC)
The Person designated as having complete responsibility for the safety of the dive operation including the responsibility for the safety and health of all diving personnel.

Dive
An exposure to increased pressure whether under water or in a hyperbaric chamber.
Dive Computer
A microprocessor based device that computes a diver’s theoretical decompression status, in real time, by using pressure (depth) and time as input to a decompression model, or set of decompression tables, programmed into the device.

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

Dive Location Reserve Breathing Gas
A supply system of air or mixed-gas (as appropriate) at the dive location that is independent of the primary supply system and sufficient to support divers during any planned decompression dive.

Dive Site
The physical location of a diver during a dive.

Dive Station
See Dive Site.

Dive 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. Also called dive tables.

Dive Team
Any individual exposed to or controlling the exposure of others to hyperbaric conditions.

Diver
An individual in the water who uses apparatus, including snorkel, to supply breathing gas at ambient pressure.

Diver-Carried Reserve Breathing Gas
A diver-carried independent 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 another diver.

Diver-in-Training
An individual gaining experience and training in additional diving activities under the supervision of a dive team member experienced in those activities.

Diving Control Board (DCB)
The group of individuals who act as the official representative of TAMUCC in matters concerning the diving program.

Diving Mode
A type of diving requiring specific equipment, procedures, and techniques, for example, snorkel, scuba, surface-equipped air, or mixed-gas.

Diving Operations
Any work operation requiring some type of diving or work underwater that involves planned human exposure to increased pressures to perform the job.

Diving Operating Personnel
Any member of a dive team whose activities are regularly scheduled as necessary to conduct diving operations at or from the dive station.

Diving Safety Officer (DSO)
The individual responsible for the safe conduct of the diving program.

Dry Suit
A diving suit designed to exclude water from the surface of the body.

EAD
See Equivalent Air Depth.

Emergency Ascent
An ascent made under emergency conditions where the diver exceeds the recommended ascent rate.
**Enriched Air (EANx)**
A name for a breathing mixture of air and oxygen when the percentage of oxygen exceeds 21%. This term is considered synonymous with the term “NITROX”.

**Equivalent Air Depth (EAD)**
Depth at which the gas mixture being used will have the same nitrogen partial pressure as air at one atmosphere (sea level). This number, expressed in units of feet of seawater, will always be less than the actual depth for any enriched air mixture.

**Exhaust Valve**
A valve controlling the venting of gas from any higher-pressure source such as a divers helmet, suit, buoyancy compensator, volume tank, etc.

**Embolism**
See Gas Embolism.

\[ f_{He} \]
Fraction of helium in a gas mixture, expressed as either a decimal or percentage, by volume.

\[ f_{N2} \]
Fraction of nitrogen in a gas mixture, expressed as either a decimal or percentage, by volume.

\[ f_{O2} \]
Fraction of oxygen in a gas mixture, expressed as either a decimal or percentage, by volume.

\[ f_{fw} \]
Feet of freshwater or equivalent static head.

\[ f_{sw} \]
Feet of seawater, or equivalent static head.

**Gas**
In diving, any respirable mixture breathed by the diver.

**Gas Embolism**
A condition caused by expanding gases that have been taken into and retained in the tissues during ascent or decompression.

**Gauge Pressure**
A term used to express the difference between atmospheric pressure and a specific pressure being measured. Abbreviated as psig, pounds per square inch gauge.

**Harness**
The combination of straps and fasteners used to attach equipment and umbilical to the diver that can be utilized as a lifting point to remove the diver from the water in the event of an emergency.

**Hookah Diving**
A diving mode in which the diver in the water is supplied from the dive location with compressed gas for breathing and has no voice communication with the tender on the surface.

**Hyperbaric Chamber**
See Decompression Chamber.

**Hyperbaric Conditions**
Pressure conditions in excess of normal atmospheric pressure at the dive location.

**Hypothermia**
Profound loss of body heat.

**Lead Diver**
Certified diver with experience and training to conduct the dive operation within under University auspices.

**MAWP**
Maximum allowable working pressure. See Maximum Working Pressure.
MSW
Meters of seawater or equivalent static head.

**Maximum Operating Depth (MOD)**
A depth at which the PPO2 (partial pressure of oxygen) for a gas mixture reaches a predetermined maximum.

**Maximum Working Pressure**
The maximum pressure to which a pressure vessel may be exposed under standard operating conditions (usually the pressure setting of the pressure relief device).

**Mixed-gas diving**
AAUS defined diving mode in which the diver is supplied in the water with breathing gases with > 1% of another inert gas besides nitrogen. Sometimes referred to as Trimix.

**Nitrox**
Any gas mixture comprised predominately of nitrogen and oxygen, most frequently containing between 21% and 40% oxygen. Also referred to as Enriched Air Nitrox, abbreviated EANx.

**NOAA**
National Oceanic and Atmospheric Administration; a branch of the U.S. Department of Commerce.

**No-Decompression Diving**
Diving which involves depths and times shallow and short enough so that the ascent can be made to the surface without water stops or subsequent chamber decompression.

**No-Decompression Limits**
The depth-time limits of the "no-decompression limits and repetitive dive group designation table for no-decompression air dives" of the U.S. Navy Diving Manual or equivalent limits.

**Non-Return Valve (Check Valve)**
A one-way check valve installed in a fluid or gas system to permit flow in one direction only. All diving helmets must have a non-return valve at the gas supply inlet to prevent depressurization of the helmet and the resultant squeeze, if the gas supply is lost.

**Normal Ascent**
An ascent made with an adequate gas supply at a rate of 60 feet per minute or less.

**Organizational Member**
An organization who is a current member of the AAUS, and which has a program, which adheres to the standards of the AAUS as set forth in the AAUS Standards for Scientific Diving Certification and Operation of Scientific Diving Programs.

**Over Bottom Pressure (OBP)**
That pressure above ambient, at which a breathing gas supply must be supplied to the helmet/mask so that the diver will have a sufficient supply of gas.

**Oxygen Cleaning**
A special cleaning process for equipment used in oxygen systems to remove flammable/combustible contaminants.

**Oxygen Compatible**
A gas delivery system that has components (O-rings, valve seats, diaphragms, etc.) that is compatible with oxygen at a stated pressure and temperature.

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

**Oxygen Toxicity**
Any adverse reaction of the central nervous system ("acute" or "CNS" oxygen toxicity) or lungs ("chronic", "whole body", or "pulmonary" oxygen toxicity) brought on by exposure to an increased (above atmospheric levels) partial pressure of oxygen.

**Partial Pressure**
That portion of the total gas pressure exerted by a particular constituent of the breathing mixture.
Pressure-related Injury
Any injury resulting from pressure dis-equilibrium 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.

PPN2
Inspired partial pressure of nitrogen, usually expressed in units of atmospheres absolute.

PPO2
Inspired partial pressure of oxygen, usually expressed in units of atmospheres absolute.

psi
Pounds per square inch. An expression of pressure, for example, one atmosphere equals 14.7 psi.

psig
Pounds per square inch gauge.

Recompression Chamber
See Decompression Chamber.

Relief Valve
A pressure-relieving device that prevents pressure from rising above a preset level.

Scientific Diving
Is defined (29CFR1910.402) as diving performed by individuals 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
Acronym for Self Contained Underwater Breathing Apparatus. Used to describe a diving mode in which the inspired gas is delivered from a demand regulator and exhaled into the surrounding water (open-circuit); the gas supply is carried on the diver’s back. Primarily used for relatively shallow recreational-related diving.

Snorkeling
See Breath-hold diving.

Squeeze
A lack of equalization between part of the body or between the body and equipment. Extreme cases can cause severe injury or death.

Standby Diver
A diver at the dive location in a state of readiness, capable of rendering immediate and rapid assistance to a diver in the water.

Surface-supplied Diving
Diving mode in which the diver in the water is supplied breathing gas from a supply on the surface and is in constant voice communication with the tender on the surface.

Swimming Ascent
An ascent that can be done under normal or emergency conditions accomplished by simply swimming to the surface.

Tender
The individual responsible for seeing the diver receives care both topside and underwater; also called the attendant.

Treatment Table
A depth-time and breathing gas profile designed to treat decompression sickness or air embolism.
**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, and heat, as appropriate to the diving mode or conditions, and includes a safety line between the diver and the dive location.

**Underwater Time**
The total elapsed time measured in minutes, from the time when a diver leaves the surface in descent until the diver returns to the surface.

**Valve**
A device that starts, stops, or regulates the flow of fluids.

**Volume Tank**
A pressure vessel connected to the outlet of a compressor and used as a gas reservoir.

**Weight Belt**
A belt worn by a diver to achieve desired buoyancy.

**Working Diving**
Is defined (29CFR1910.402(a)(2)) as any diving and related support operations conducted in connection with all types of work and employment. Working diving does not apply to diving operations performed solely for; instructional purposes; search, rescue, or related public safety purposes; 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; or scientific diving and which is under the direction and control of a diving program consisting, at a minimum, of a diving control board and dive safety manual.

**Working Pressure**
The maximum pressure at which the system is designed to operate under standard conditions.

**Work Site**
An underwater location where work is performed.