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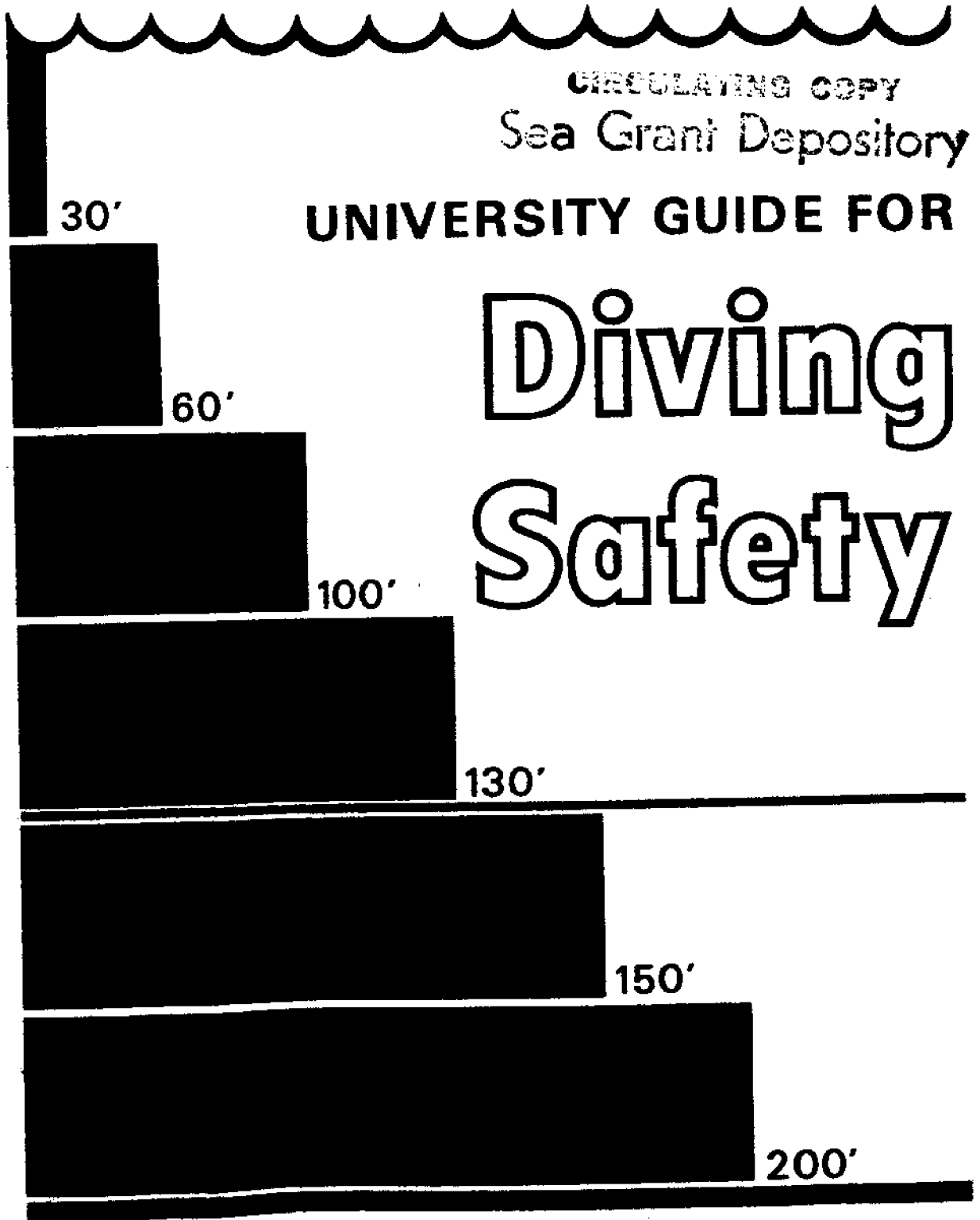
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UNIVERSITY GUIDE FOR

Diving Safety



TEXAS A&M UNIVERSITY  SEA GRANT PROGRAM

ADDENDUM I - 8/71 Corrections, Changes, and Additions to University Guide for Diving Safety, Schroeder and Fife, 1970, Texas A&M University, Sea Grant Publ. No. TAMU-SG-70-602.

Page iii Section Six Diving Rules
ADD 6.00 University Sponsored Dive p. 18.

Page 1 Section One

ADD - Diving Master This is a title assigned to certain University divers by the Diving Control Board. To obtain this title, a diver must be an experienced and reliable diver who has demonstrated a sense of responsibility and good judgement in diving matters. He must, in the opinion of the Board, be able to accept full responsibility for a University sponsored diving operation. Each official University sponsored dive will be under the personal supervision of a Diving Master.

- Reciprocity u in university should be changed to small case, as well as s in self-contained underwater.

ADD - University sponsored dive This is any diving operation which is a required part of either a University sponsored scientific or training program.

Page 2 Section 2.13 " ... of Texas A&M University." should read " ... of the Texas A&M University System."

Page 6 Sections 3.42, 3.43, and 3.44 change to Sections 3.42*, 3.43*, and 3.44*.

Page 6 Section 3.52 Omit " ... (at least partially) ..."

Page 6 Bottom of Page ADD
*Special attention is called to the fact that these tests demand caution since it is possible for the swimmer to lose consciousness underwater while carrying them out. It is strongly recommended, therefore, that at least one diver with SCUBA be stationed underwater during these tests. He should be instructed to move to a swimmer with all haste the moment the swimmer ceases purposeful coordinated forward movement.

Page 7 Section 3.55 This underwater swim has been omitted as a requirement.

Page 7 Section 3.56 Change to Section 3.55.

Page 7 Section 3.75 Should be changed to read "Demonstrate "buddy breathing"."

Page 8 Section 3.86 Should be changed to read "Enter and leave surf wearing SCUBA. Also enter from boats into water and from water back into boats of various kinds while wearing SCUBA."

ADDENDUM I - 8/71 (cont.)

Page 10 Section 4.13

ADD

On a University sponsored dive where two officials authorized by the President or his representative to certify divers are not available, the Diving Master shall have the authority to certify, on a temporary basis, competent divers who have demonstrated the required proficiency in diving. The documents listed below in 4.20 (except for the Release/Waiver) may be waived. The temporary diving certificate shall be usable only for the period and depths specified.

Page 18 Section Six

ADD - Section 6.00

UNIVERSITY SPONSORED DIVE

To become an official University sponsored dive, the specific project or operation must be registered with the Office of D. H. & S. and must be under the direct and personal supervision of a designated Diving Master. That Diving Master will be in personal charge of all diving operations related to this sponsored dive. It is the personal responsibility of the Diving Master to see that: (1) the project or operation is registered at least 48 hours in advance of any diving with the Office of D. H. & S.; (2) during the diving operation, a daily diving log is maintained and in the event of any diving related accident requiring more than basic first aid treatment, report the accident to the Office of D. H. & S. or a member of the Diving Control Board; (3) within ten working days of the completion of diving operations, file a complete post dive report of all diving activities including: a) the onsite daily diving log; b) any temporary certifications issued; and c) a report of all diving related accidents. ALL NECESSARY FORMS MAY BE OBTAINED AT THE OFFICE OF D. H. & S.

Page 13 Section 4.54

" ... as the University may impose." should read " ... as the University Diving Control Board may impose."

Page 16 Section 5.30

" ... maximum total oxidants - - - 0.000005% (.05ppm)" should be changed to read " ... maximum total oxidants - - - 0.000005% (.05ppm)"

Page 17 Section 5.43

" ... filed with the University authorities." should read " ... filed with the Diving Health and Safety Officer."

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UNIVERSITY GUIDE
FOR
DIVING SAFETY

by

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Partially Supported by the Marine Biomedical Institute
and the National Science Foundation Sea Grant Program

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PREFACE

This Guide is the result of the need to establish guidelines for diving under the auspices of Texas A&M University. Much of the contents have been taken from the University of California's "Guide for Diving Safety." This is in part because it is believed that the "Guide for Diving Safety" represents the best document of its kind available up to this time. It also has been done in order that reciprocity of diver certification might exist between the University of California System, the Texas A&M University System, and other universities and colleges that have similar programs.

The variations between the University of California Guide and this Guide are due to the pronounced regional differences.

We would like to thank Mr. Jimmy Stewart, Diving Officer at Scripps Institution of Oceanography for his encouragement to start our diving program and his help in the development of this Guide.

The suggestions and comments made towards the Guide by Dr. Richard A. Geyer, Dr. Richard Rezak, Dr. Thomas J. Bright, Mr. Serpell Edwards, and Dr. J.T.L. McNew, MD., during its preparation are very much appreciated.

The development of this Guide was supported in part by the National Science Foundation Sea Grant Program Institutional Grant GH-59 and the Marine Biomedical Institute.

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SECTION ONE

DEFINITIONS AND TERMS

Certified Diver	SCUBA or surface-supplied diver who has a current University Diving Certificate. Expiration dates are specified in Section 4.50.
Diving	Underwater diving: SCUBA and surface-supplied.
Diving Certificate	Issued by the University as evidence of University approval for underwater diving until the expiration date shown. See Section Four.
D. H. & S.	Abbreviation for Diving Health and Safety.
Learner's Permit	Issued by the University as evidence of University approval for instruction in underwater diving only as part of the training specified in Section Three.
Open Circuit SCUBA	No portion of the breathing gas is rebreathed.
Reciprocity	With due regard for local ground rules, Certified Divers from one University are normally granted equivalent diving privileges on other University campuses, and Self-contained underwater breathing apparatus approved by one University is normally thereby equally acceptable by other Universities. Reciprocity for marine diving is not granted until the diver has completed specific marine training.
SCUBA	Self-contained underwater breathing apparatus.
University Auspices	Diving by University employees and registered University students when diving under supervision of University employees as a necessary part of research or instruction constitutes diving under University auspices.

SECTION TWO
POLICY ON DIVING

2.10 PURPOSE

2.11 The Diving Safety Program

The purposes of a diving safety program are to insure that all diving under the auspices of Texas A&M University is conducted in a manner designed to minimize accidental injury or occupational illness, and to set forth rules, regulations and standards for training and certification which will allow a working reciprocity between the campuses of the Texas A&M University System, and other colleges, universities and state and federal agencies engaged in scientific diving.

2.12 The Guide for Diving Safety

The purpose of the Guide for Diving Safety is to set forth the basic underwater diving safety policy, organization, regulations and procedures for safety in diving operations and for reciprocity of diver certification among the campuses of the Texas A&M University System and other colleges, universities and state and federal agencies.

2.13 Supplementary University Guides or Manuals

The President or his representative may promulgate supplementary University guides or manuals with additional rules and regulations to cover specific situations existing on individual campuses. However, the regulations set forth in this Guide for Diving Safety are basic and should be observed wherever diving is conducted under the auspices of Texas A&M University.

2.20 SCOPE

2.21 University Auspices

Underwater diving under the University auspices is limited to diving in connection with:

- Occupation
- Research
- Academic work (instructional)
- Training and certification for required University diving.

2.22 Training and Certification

Any person diving under University auspices is required to observe the provisions of this Guide. Diving under University auspices is not authorized by individuals until they have met the requirements for diving pertinent to the level of the proposed activity.

2.23 Equipment

All diving under University auspices shall be done with equipment, regardless of ownership, which conforms to the standards set forth in Section Five of this Guide.

2.24 Diving Rules

The regulations herein shall be observed at all locations, whether or not owned by the University, where diving is carried out under University auspices.

2.30 AUTHORITY AND RESPONSIBILITY

2.31 President

Maximum authority and operational responsibility for the conduct of the diving safety program on each campus is vested in the President or his authorized representative. He is responsible for providing surveillance of University diving activities, interpreting University policies, and developing additional University policies, regulations and standards consistent with University policies. (See Appendix I for University organization).

SECTION THREE

TRAINING

3.10 ELIGIBILITY

3.11 Only persons diving under University auspices are eligible for University training and certification. Generally these people will be affiliated with the University. However, non-University people may be admitted to the training program for underwater divers with the permission of the President or his authorized representative.

3.12 The applicant for training and certification shall normally be at least eighteen years of age.

3.20 MEDICAL EVALUATION

Each registered student applicant for diver training shall submit to the Office of Diving Health & Safety a report of medical evaluation on a form approved by the D. H. & S. Officer, signed by a licensed physician attesting to the applicant's medical fitness for diving with SCUBA. Based on this medical evaluation plus additional evaluation if requested by a licensed physician or the D. H. & S. Officer, the Medical Advisor of the Office of D. H. & S. will then issue a statement as to whether or not the applicant is medically qualified to engage in SCUBA diving. A complete medical evaluation must be accomplished prior to commencement of SCUBA diving training and at least annually as long as the individual is diving under University auspices. An appropriate evaluation must also be accomplished after each significant illness or injury.

(See Appendix II).

3.30 RELEASE AND WAIVER

All students and other persons (other than University employees) diving under University auspices shall execute a release holding the University, its employees, and the Board of Directors harmless from any claims which might arise in connection with SCUBA diving.

This release to read:

Release and Waiver

The undersigned and, in the event the undersigned is under 21 years of age, the undersigned's parents and/or guardians, for and in consideration of the granting of permission by the Board of Directors of the Texas A&M University System, for said undersigned to become a certified SCUBA diver and to engage in SCUBA diving under the auspices of Texas A&M University, hereby hold(s) harmless and release(s) and forever discharge(s) the Board of Directors of the Texas A&M University System, the Diving Control Board, the Diving Officer, and all of the Board of Directors' agents, officers, assistants, and employees, either in their individual capacities or by reason of their relationship to the said Board of Directors of the Texas A&M University System, and their successors, from any and all claims and demands whatsoever, which the undersigned and any of them, and the heirs, representatives, executors and administrators thereof, or any other persons acting on the behalf, or on the behalf of their respective agents, have or may have against the said Board of Directors of the Texas A&M University System, or any or all of the above-mentioned persons or their successors, by reason of any accident, illness, injury or death, or other consequences arising or resulting directly or indirectly from participation in SCUBA diving under the auspices of Texas A&M University, and occurring during said participation, or at any time subsequent thereto.

Dated this _____ day of _____ 19 _____

Witness

Father (or guardian)

Witness

Mother (or guardian)

Participant

It is not necessary, however, to require these releases from University employees, either academic or non-academic, who dive in the course of their employment.

3.40 SWIMMING TESTS

The applicant for training shall successfully perform the following tests, or their equivalent, in the presence of an examiner specified by the President or his representative, prior to any formal pool instruction.

- 3.41 Swim 1,000 feet in less than 10 minutes without fins.
- 3.42 Swim underwater without fins for a distance of 75 feet without surfacing.
- 3.43 Swim underwater without fins for a distance of 125 feet without surfacing more than four times.
- 3.44 Surface dive without fins to a depth of at least 10 feet, recover a 10 lbs. weight, and carry it underwater for a distance of 25 feet without surfacing.
- 3.45 Surface dive without fins to a depth of at least 10 feet, recover a swimmer, and carry the swimmer 75 feet at the surface.
- 3.46 Without fins, simulate rescue of a struggling swimmer.
- 3.47 Tread water for 3 minutes.
- 3.48 Stay afloat for 5 minutes without accessories.
- 3.49 During the above tests, demonstrate "Good" individual watermanship.

3.50 SNORKEL DIVING TEST

The applicant for training shall successfully perform the following tests, or their equivalent, either in conjunction with the swimming test or upon the completion of formal pool instruction, in the presence of an examiner specified by the President or his representative.

- 3.51 Swim 1,200 feet with fins, mask, and snorkel alternating swimming on the surface and underwater.
- 3.52 Recover and clear (at least partially) mask and snorkel from a depth of at least 10 feet.
- 3.53 Demonstrate an acceptable head first and feet first surface dive.
- 3.54 Swim 100 feet using the snorkel without the mask.

- 3.55 Swim underwater with fins, mask, and snorkel for a distance of 100 feet without surfacing.
- 3.56 Demonstrate ability to enter water with fins, mask, and snorkel by jumping in feet first, rolling in backwards, and rolling in forward.

3.60 LEARNER'S PERMIT FOR SCUBA TRAINING

At the successful completion of the requirements for eligibility, medical evaluation, and swimming and snorkel diving tests, the trainee would be eligible for a University SCUBA learner's permit. This permits the trainee to make underwater training dives with SCUBA under the supervision of his instructor.

3.70 POOL TRAINING

At the completion of pool training, the trainee must demonstrate his ability to perform the following in a swimming pool:

- 3.71 Rescue and tow, without fins, the simulated victim of an accident: (a) victim wearing SCUBA; (b) rescuer and victim both wearing SCUBA.
- 3.72 Remove and replace approved SCUBA and mask at a depth of at least 10 feet.
- 3.73 Clear face mask with no purge valve.
- 3.74 Enter water with full equipment by jumping in feet first; rolling in backwards; rolling in forward.
- 3.75 Demonstrate "Buddy breathing" using both single and double hose units.
- 3.76 Demonstrate ability to alternate snorkel and SCUBA while swimming in the deep end of the pool or in open water.
- 3.77 Demonstrate ability to enter the pool with all equipment in his arms and don the equipment while on the bottom of the pool.
- 3.78 Demonstrate understanding of underwater signs and signals.
- 3.79 Demonstrate knowledge of current artificial respiration methods.

3.80 MARINE AND OTHER OPEN WATER TRAINING

The trainee must satisfy an instructor approved by the President or his representative of his judgement adequate for safe diving, and his ability to perform the following in the marine or other open water:

- 3.81 Swim 1,000 feet without fins in the marine or other open water in less than 12 minutes.
- 3.82 Surface dive to a depth of at least 15 feet in the marine or other open water without SCUBA.
- 3.83 Exchange mouthpiece with partner: (a) partner with air, depth greater than 15 feet; (b) partner without air, depth greater than 15 feet.
- 3.84 Demonstrate "Buddy breathing" while ascending from a depth of 30 feet: (a) partner with air; (b) partner without air.
- 3.85 Ditch equipment as directed by the instructor and make free ascent to surface. Return and replace equipment at a depth greater than 15 feet.
- 3.86 Enter and leave surf wearing SCUBA.
- 3.87 Snorkel 1,000 feet with SCUBA gear in position.
- 3.88 Complete 12 marine or other open water dives, (minimum of 8 marine dives) for a minimum total time of four hours at a depth not to exceed 30 feet, accompanied or supervised by a diving instructor designated by the President or his representative. No more than four dives shall be made in any one day.
- 3.89 Compute his own air consumption rate in cu.ft./min. for each training dive and describe to instructor how to detect low air pressure in his tank.

3.90 WRITTEN EXAMINATION

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

- 3.91 How the various pieces of diving equipment function, and their care.
- 3.92 The physics and physiology of diving.
- 3.93 Hazards of breath-hold diving.

3.94 The causes, signs, symptoms, prevention, and first aid for the following:

- Near drowning
- Air embolism
- Carbon dioxide excess
- Exhaustion
- Respiratory fatigue
- Oxygen poisoning
- Nitrogen narcosis
- "Bends"
- Carbon monoxide poisoning
- "Squeeze"

3.95 The diving regulations and precautions.

3.96 Near-shore currents and waves.

3.97 Dangerous marine animals and fresh water hazards.

3.98 Underwater communication.

3.99 Procedures to be followed in emergencies and current U.S. Navy repetitive decompression tables and procedures.

SECTION FOUR

CERTIFICATION

4.10 KINDS

Any person diving under University auspices must have one of the following permits.

4.11 Learner's Permit

Usable only during training and under the supervision of the authorized instructor (See Section 3.60).

4.12 SCUBA Diving Certificate

This is a permit to dive, usable only while it is current and for the purpose intended. The certificate shall include the environment (marine or fresh water) in which the diver is authorized to dive, the depth to which the diver is authorized to dive, the date of the most recent physical examination (required annually), and an expiration date.

4.13 Temporary SCUBA Diving Certificate

With the written approval of two officials authorized by the President or his representative to certify divers, the documents listed below in 4.20 (except the Release and Waiver) may be waived for a SCUBA diver who has demonstrated the required proficiency in diving and can contribute substantially to the specific dives planned. The Temporary Diving Certificate shall be usable only for the period specified.

4.20 OBTAINING A CERTIFICATE

At the conclusion of the training period, which will normally constitute a minimum of 100 hours of training, the following documents recording the successful completion of the requirements must be submitted:

Application for a SCUBA Diving Certificate	
Medical Evaluation	(See Section 3.20)
Release and Waiver	(3.30)
Swimming Test	(3.40)
Snorkel Diving Test	(3.50)
Pool Training	(3.70)
Marine and Other Open Water Training	(3.80)
Written Examination	(3.90)
Log of Twelve Dives	

Submission of these documents does not automatically result in a certification. In every case the diver must satisfy at least two qualified individuals appointed by the President or his representative that he is sufficiently skilled and proficient to be certified. This skill will be attested to by the signatures of the individuals.

4.21 Denial of Certificate

Any applicant who in the opinion of the Certifying Officer does not appear to possess the judgement necessary under diving conditions for the safety of the diver and his partner may be denied certification. The decision of the Certifying Officer is final, subject to review only by the University Diving Control Board.

4.22 Waiver of Specific Requirements

If an applicant for certification can show evidence of previous qualifying experience or training, he may be granted a waiver for specific requirements of training and experience. The requirements for medical evaluation, written examination, or Release and Waiver shall not in any case be waived.

4.23 Registration

All permits issued -- Learner's Permit, Diving Certificate, and Temporary Diving Certificate -- shall be registered on the campus in the Office of D. H. & S.

4.30 ENVIRONMENTAL CERTIFICATION

The Diving Certificate will authorize the holder to dive with SCUBA in the environment indicated on the certificate.

4.31 Certification for the Fresh Water Environment

The Fresh Water Certification is obtained by completing the depth qualifying dives (Section 4.42) in the fresh water environment and permits the diver to dive in the fresh water environment only.

4.32 Certification for the Marine Environment

The Marine Certification is obtained by completing at least 1/2 of the depth qualifying dives (Section 4.42) in the marine environment and permits the diver to dive in both the marine and fresh water environments.

4.33 Certification After Completion of the 100 Hour Training Period

The 100 Hour 30 Foot Certification, issued after the successful completion of the training period (Section Three and Section 4.20) will in all cases be a Marine Certification (See Section 3.87).

4.34 Changing From the Fresh Water to the Marine Certification

A diver certified in the fresh water environment for 60, 100, or 130 foot depths may qualify for a Marine Certification by completing in the marine environment 1/2 the required number of fresh water dives at depths he is currently certified, and then may become certified to the next greater depth by following Sections 4.32 and 4.42.

4.40 DEPTH CERTIFICATION

The Diving Certificate will authorize the holder to dive with SCUBA to the depth indicated on the certificate.

4.41 Certification for 30 Foot Depth

This is the initial certification, approved upon the successful completion of the training listed in Section Three (See Section 4.33 for environmental certification).

4.42 Certification for 60, 100, and 130 Foot Depths

A diver holding 30 foot certification may be certified to a depth of 60 feet after successfully completing under supervision, 12 logged training dives to depths between 31 and 60 feet, for a minimum total time of 4 hours (See Sections 4.31 and 4.32 for environmental certification). If the diver is certified in the fresh water environment and wishes to become qualified for the marine environment, see Section 4.34. Through similar procedures, a diver may qualify for certification to the depth next greater than that shown on his certificate. For depths of 100 and 130 feet, minimum total time underwater during training dives shall be 2 hours. Depth Certification shall be validated by the signature of two authorized individuals who are divers and are themselves certified to at least the same depth and environment. The diver shall also demonstrate proficiency in the use of the U.S. Navy decompression tables.

4.43 Certification to Depths Over 130 Feet

A diver may be certified to depths of 150 and 200 feet after the completion of four dives near each depth. For a Marine Certification, all four dives must be made in the marine environment. Dives shall be planned and executed under close supervision of a diver certified to this depth. The diver must also demonstrate a knowledge of the special problems of deep diving and of special safety requirements.

4.50 MAINTENANCE OF CERTIFICATION

4.51 Term of Certificate

All diving certificates shall expire one year from the date of the last medical examination, or four months from the date of the last logged dive.

4.52 Diving Activity

During any 12 months period, each certified diver shall normally log a total of 12 dives. At least one dive to the depth of certification shall be made during each four months period. Divers certified to 150 feet or over may satisfy these requirements with dives to 130 feet or over. If the diver holds a Marine Certification and wishes to maintain it, the depth certification dives must be made in the marine environment. Credit for qualifying dives must be supported by the diver's log. No credit will be given for dives not properly logged and thus may be cause for revocation or restriction of a certificate.

4.53 Annual Medical Examination

All certified divers shall pass an annual medical examination. After each major illness or injury, certified divers shall submit to medical interview and/or examination at the option of the D. H. & S. Officer before resuming diving activities.

4.54 Recertification

If a diver's certificate expires or is revoked, he may be recertified after complying with such conditions as the University may impose.

4.60 REVOCATION OF CERTIFICATE

A diving certificate may be revoked or restricted for cause. Violation of any regulations in this Guide or of pertinent rules, regulations, or laws (i.e. State Game and Fish Regulations) may be considered cause. The diver shall be informed of the reasons for revocation, and he will be given an opportunity to present his case. The University President or his representative will be the final office of appeal.

SECTION FIVE

SCUBA EQUIPMENT

5.10 SCUBA REGULATORS

5.11 Approval

Only those makes and models of regulators specifically approved by the University Diving Control Board shall be used. Current lists of this equipment will be available through the Diving Control Board.

5.12 Inspection and Maintenance

All SCUBA regulators procured by the University and those privately owned and used on University sponsored projects shall be inspected and tested before initial use and at six month intervals thereafter by a mechanic approved by the University Diving Control Board. A record of inspections and overhauls shall be maintained by either the University or by the private owner, depending on ownership.

5.20 AUXILIARY SCUBA EQUIPMENT

5.21 Approval

All auxiliary SCUBA equipment shall be of a type approved by the University Diving Control Board.

5.22 All compressed air tanks shall bear a valid test date, and shall be tested in accordance with Interstate Commerce Commission regulations. Before "first use" of any tank for diving, and annually thereafter, it shall be examined by a qualified mechanic.

5.23 Harness and Weight Belts

Air tanks, back packs, and weight belts shall be regularly examined by the persons using them, and any defective gear shall be repaired or replaced before further use.

All air tank harness and weight belts shall have quick release devices designed to permit jettisoning the entire gear. The quick release device must operate easily with either hand.

5.24 Depth Gauges

Only those makes and models of depth gauges specifically approved by the University shall be used. Gauges shall be inspected and tested before "first use", and every six months thereafter. Inaccurate gauges shall not be used under any circumstances until repaired. A record of inspections and tests shall be maintained by either the University or by the private owner.

5.30 BREATHING-AIR STANDARDS

Breathing-air for SCUBA use shall meet the following specifications:

Minimum oxygen -----	atmospheric
Oxygen content - special mixtures used must be as specified in U.S. Navy Diving Manual, part 3, or its equivalent	
Maximum carbon monoxide (for decompression dives*) -----	0.001%
Maximum carbon monoxide (for non- decompression dives**) -----	0.002%
Maximum carbon dioxide -----	0.030%
Maximum total hydrocarbons -----	0.005% (50 ppm)
Maximum total oxidants -----	0.0000005% (.05 ppm)
Dust and droplets of oil and water -----	absent
Odors and vapors -----	absent

*Maximum carbon monoxide content of 0.001% is specified for decompression dives, as defined by the 1958 U.S. Navy Diving Tables, because it is felt that such dives are sufficiently hazardous without adding the possible danger from the effects of higher carbon monoxide concentration.

**In the absence of physiological measurements of the effects of CO under conditions higher than atmospheric pressures, the value of 0.002% has been accepted on the basis of the available knowledge from the literature and diving experience. Clinical information is very meager, and therefore, the concentration should be kept below this.

5.40 SOURCES OF BREATHING-AIR

5.41 Records

A log shall be maintained showing operation, repair, overhaul, filter maintenance, temperature adjustment, and results of all gas analyses and air tests for all University controlled breathing air compressor apparatus. Records shall be available for audit.

5.42 Certification and Testing

Breathing-air from commercial sources approved by University authorities shall be certified by the supplier as suitable for breathing, according to specifications in Section 5.30 or it shall be tested before use by the University personnel.

5.43 Record of Vendor's Certification

One copy of vendor's certification or vendor's verification of producer's certification for each lot of compressed air shall be filed with the University authorities.

5.50 AIR COMPRESSORS

Water lubricated compressors are preferred for compressing air for charging SCUBA tanks. However, if a manufacture representative (to include servicing and parts) is not readily available, serious consideration should be given to other lubrication systems.

5.51 All compressor installations shall comply with the following specifications:

- (a) The air intake shall be provided with a filter and shall be located to insure a supply of clean air, free from contamination by fumes, smoke, etc.
- (b) The discharged compressed air shall be passed to compressed air holder through frequently cleaned and recharged filters designed to remove carbon monoxide, dust, and droplets of oil and water, and to minimize other contaminants.

5.52 The following additional requirements apply to compressors that may produce carbon monoxide or other toxic materials (i.e. oil lubricated compressors):

Oil lubricated compressor cylinders and coolers shall be well ventilated or otherwise cooled, or the operation cycled to insure against high temperatures at which CO is formed from the oil.

SECTION SIX

DIVING RULES

6.10 CERTIFICATION REQUIRED

No person shall engage in diving under the auspices of Texas A&M University unless he holds a valid certificate issued by a University (See Section Four).

6.11 Environmental Limitations

A diver certified in the fresh water environment may only dive in the fresh water environment. A diver certified in the marine environment may dive in both the fresh water and marine environments. A diver with a Fresh Water Certification may, with the written permission from the Diving Safety Officer or his representative, accompany a diver with a Marine Certification on a marine dive. This temporary Marine Certification shall be usable only for the period specified (See Section 6.12 for depth limitations).

6.12 Depth Limitations

A diver may not exceed his depth of certification more than one step. No diver shall exceed his depth of certification unless accompanied by a diver certified to a greater depth. No diver shall supervise more than one diver who is exceeding the depth of his certification unless all divers are certified to at least 100 feet. For the purpose of this section, the steps are defined as: 30 feet; 60 feet; 100 feet.

6.20 DIVING PROCEDURES

6.21 Solo Diving Prohibited

All dives shall be organized and conducted by certified divers in pairs, unless the specific task, (i.e. training) being undertaken requires otherwise.

6.22 Buddy - Distance Range

"Buddy - Distance Range" is that distance which separates one buddy from another during performance of a SCUBA dive. This range may vary dependent upon the time, depth and circumstance, but should never exceed the limits of actual visual contact, or during dives of extremely low visibility, actual physical contact. Exceptions to this provision will be made if approved underwater communications are available or upon the specific authorization of the Diving Officer.

6.23 Diver's Flag

A diver's flag, red with diagonal white stripe, shall be prominently displayed whenever diving is conducted where it is possible that boat traffic may be in the vicinity.

6.24 Flotation Device

On every dive, all divers shall wear adequate flotation gear which has been approved by the University authorities.

6.25 Dives Over 100 Feet in Depth or Repetitive Dives

During dives to depths over 100 feet, or repetitive dives to lesser depths, or in waters of unknown depths, at least one member of the diving pair must have a watch and an approved depth indicator.

6.26 Dives Over 200 Feet in Depth

Divers certified to 200 feet may dive to greater depths only with written permission from the University Diving Control Board. Application for approval shall be in writing and shall describe the preparation, planning, and purpose of the dive. A written report shall be submitted at the completion of the dive, describing the experiences of the divers while underwater and any accidents or after-effects.

6.27 Decompression

Current U.S. Navy Decompression Tables and Procedures shall be followed during all diving operations unless another procedure or device is authorized.

6.30 INDIVIDUAL DIVER RECORDS

6.31 Diving Log

Each certified diver shall log every dive made under University auspices. Divers are encouraged to log all other dives, including sport dives.

6.32 Information Required

The Diving Log shall be in a form specified by the University and shall include at least the following:

- (a) Name of diver
- (b) Name of partner
- (c) Date, environment, depth, and location of dive
- (d) Time underwater
- (e) Purpose of dive
- (f) Detailed report of any accident or potentially dangerous incident

6.33 Submission of Log

Log sheets shall normally be submitted monthly to the D. H. & S. Office for audit.

6.40 DIVER'S RESPONSIBILITY

6.41 Safety

Ultimate responsibility for safety rests with the individual diver. It is the diver's responsibility and duty to refuse to dive if, in his judgement, conditions are unsafe or unfavorable, or if he would be violating the precepts of his training or the regulations of this Guide.

6.42 Emergencies

In emergencies when danger to life exists or is probable, divers may, at their own discretion, violate these regulations. A written report of all such incidents shall be submitted explaining the circumstances and justifications for actions taken.

APPENDICES

UNIVERSITY ORGANIZATION

The President or his representative is responsible for the underwater diving safety program. To conduct this University program, the following organization is to regulate diving activities.

A. Diving Health and Safety Officer

1. Authority

- a) The Diving Health and Safety Officer has the authority to suspend diving programs that are unsafe.
- b) The Diving Health and Safety Officer meets with the Diving Control Board as an ex-officio member.

2. Responsibilities

The Diving Health and Safety Officer is responsible for:

- a) General surveillance over the health and safety aspects of the diving program in accordance with University policies governing safety and the use of humans for research.
- b) Provides audit of all diving program records pertaining to safety.

B. University Diving Control Board

1. Composition

The Diving Control Board is an administrative committee, appointed by the President or his representative. It is composed of five experienced divers, including the University Diving Officer. The D. H. & S. Officer serves as an ex-officio member.

2. Authority

The Diving Control Board has the authority to recommend the issue, reissue, or revocation of diving certificates. It also has authority to suspend diving operations or programs that it considers unsafe or unwise.

3. Responsibilities

The Diving Control Board has the responsibility to:

- a) Recommends to the President or his representative changes in policy and amendments to the University Guide for Diving Safety as the need arises.
- b) Establishes and/or approves training programs through which applicants for certification can satisfy the requirements of this Guide.
- c) Approves locations where diving may be conducted under University auspices.
- d) Approves new equipment or techniques for University use.
- e) Establishes and/or approves facilities for the inspection and maintenance of SCUBA and associated equipment.

C. University Diving Officer

1. Authority

The President or his representative may authorize the Diving Officer to restrict or suspend any diving activity that is, in his judgement, unwise or unsafe. He will inform the University Diving Control Board of any such restrictive actions. The Board may recommend to the President or his representative that the restriction or suspension be overruled, but such a recommendation requires the approval by vote of a majority of the members of the Board.

2. Responsibilities

- a) Surveillance and coordination of all diving programs (instructional, scientific, recreational, etc.) with special attention to safety. Assures the implementation of all applicable University policies and standards.
- b) Supervision of instruction and evaluation of all training programs.
- c) Evaluation and surveillance of equipment and equipment maintenance programs, including arranging for or conducting tests of breathing gases and the approval and/or certification of all University sources of breathing gases.

- d) Preparation of recommendations for consideration by the Diving Control Board, such as changes in or additions to University policy, standards, and regulations to promote diving safety and efficiency; changes in training programs; locations for University sponsored diving programs; new equipment; and individuals or organizations qualified to inspect equipment.

II. MEDICAL EVALUATION (SCUBA)

General - the applicant must be free of chronic disabling disease or injury.

Visual acuity - persons having uncorrected vision of 20/200 or worse should not dive. Those persons having uncorrected vision of 20/40 to 20/200 should be allowed to dive only with an optically corrected faceplate.

Audiogram tracing - should be done on each applicant to rule out pre-existing hearing loss. Damage to the drum from diving could further compromise a hearing loss.

Vital capacity - should be within normal limits. An athlete should have no difficulty with this.

Hemogram - hemoglobin should be 95% or over, the hemogram should indicate normal gas transport mechanisms.

ENT - persons having acute or chronic sinus trouble should not dive unless free drainage of the sinuses is assured. Congestion secondary to URI or hay fever is a contraindication to diving until free passage of air is possible. Individuals with acute or chronic ear trouble should not dive until the drum has a normal appearance. Scarring from childhood otitis is not a contraindication to diving. Healed perforations of the drum of at least two months duration should not be harmed by diving, with special care being taken to keep the ears well cleared during the dive. Acute or chronic otitis externa with discharge, or moderate amounts of cerumen in the external canal should be considered harmful in diving until the canals are clear. Persons with acute upper respiratory infections may be passed, but should be strictly cautioned against diving until the URI has completely cleared. Decongestants which work well on land have been known to fail in the water, and severe squeeze can result. Bridgework or dentures should fit solidly.

Cardiovascular - disease which might prevent active exercise should reject the application. Peripheral vascular disease which might interfere with gas exchange in an extremity should also reject.

Respiratory - persons with evidence of chronic lung disease, (i.e. emphysema), interference with the free passage of air, or with poor gas exchange should be rejected. A chest x-ray should be taken. A history of asthma in childhood, with no attacks in the preceding three years, should not preclude the patient's diving, as long as there is no residual evidence of the disease.

Gastrointestinal - persons having chronic gastrointestinal disease, including ulcer, should not dive if any symptoms are present.

Neuromuscular - the applicant should be able to demonstrate good ability to perform all gross and minute tasks. Reflexes should be normal.

Endocrine - endocrine disturbances which would interfere with normal oxygen carrying capacities of response to stress should prevent the applicant from diving. Such entities would include severe hypothyroidism, Addison's Disease, etc. Diabetics who are well controlled, and can participate in other strenuous sports without loss of control of their disease should be able to dive fairly safely. This decision must be a highly individualized one.

Neuropsychiatric - this area is obviously most difficult to evaluate. If the response of the patient to stress is questionable, seriously consider disqualifying him. Emergencies 40 feet below the surface require cool judgement. The alternative is death, perhaps for his buddy also.

MEDICAL HISTORY AND EXAMINATION FORMS

TO THE APPLICANT:

You have requested training in an activity which makes considerable demands on your physical condition. Diving with certain defects amounts to asking for trouble, not only for you but for anybody who has to come to your aid if you get into difficulties in the water. For these reasons, the Office of D. H. & S. insists that you have a doctor's OK on your fitness for diving.

You are asked to fill out the Medical History form mainly to save the doctor's time. Not all the questions have a direct bearing on your fitness for diving. Some have to do with medical problems which should be looked into whether they concern diving or not. All are questions the doctor would ask you if he had time.

In many instances, your answers to the questions are more important in determining your fitness than what the doctor can see, hear, or feel when he examines you. Obviously, you must give accurate information, or the whole process becomes a waste of time. The forms will be kept in confidence. However, if you feel that any question amounts to an invasion of your privacy, you may omit the answer provided that you discuss the matter with the doctor and that he indicates that you have done so.

If the doctor concludes that diving would involve undue risk for you, remember that he is concerned only with your well-being and safety. Respect his advice.

Medical History

Name (print) _____ Age _____ Sex _____

Height: _____ inches Weight: _____ pounds

(If answers to the following questions require explanation, use the space labeled "Remarks" giving the number of the question).

1. Have you had previous experience in diving? Yes ___ No ___ Have you done any flying? Yes ___ No ___ If so, did you often have trouble equalizing pressure in your ears or sinuses? Yes ___ No ___ Can you go to the bottom of a swimming pool without having discomfort in ears or sinuses? Yes ___ No ___
2. Do you participate regularly in active sports? Yes ___ No ___ If so, specify what sport(s). If not, indicate what exercise you normally obtain. _____
3. Have you ever been rejected for service or employment for medical reasons? Yes ___ No ___ (If "Yes" explain in remarks or discuss with doctor).
4. When was your last physical examination? Month _____ Year _____
5. When was your last chest X-ray? Month _____ Year _____

6. Have you ever had an electrocardiogram? Yes ___ No ___ An electroen-
cephalogram (brain wave study)? Yes ___ No ___

(Check the blank if you have, or ever have had, any of the following.
Explain under "Remarks" giving dates and other pertinent information;
or discuss with the doctor).

- | | |
|---|--|
| 7. Frequent colds or sore throat ___ | 23. Severe or frequent head-
aches ___ |
| 8. Hay fever or sinus trouble ___ | 24. Head injury causing un-
consciousness ___ |
| 9. Trouble breathing through nose
(other than during colds) ___ | 25. Dizzy spells, fainting spells
or fits ___ |
| 10. Painful or running ear, mastoid
trouble, broken eardrum ___ | 26. Trouble sleeping, frequent
nightmares, or sleep-
walking ___ |
| 11. Asthma or shortness of breath
after moderate exercise ___ | 27. Nervous breakdown or periods
of marked depression ___ |
| 12. Chest pain or persistent cough ___ | 28. Dislike for closed-in spaces,
large open places, or high
places ___ |
| 13. Spells of fast, irregular, or
pounding heartbeat ___ | 29. Any neurological condi-
tion ___ |
| 14. High or low blood pressure ___ | 30. Train, sea, or air sick-
ness ___ |
| 15. Any kind of "heart trouble" ___ | 31. Alcoholism, or any drug or
narcotic habit ___ |
| 16. Frequent upset stomach, heart-
burn, or indigestion; peptic
ulcer ___ | 32. Recent gain or loss of weight
or appetite ___ |
| 17. Frequent diarrhea. Blood in
stools ___ | 33. Jaundice or hepatitis ___ |
| 18. Belly or back ache lasting more
than a day or two ___ | 34. Tuberculosis ___ |
| 19. Kidney or bladder disease;
blood, sugar, or albumin in
urine ___ | 35. Diabetes ___ |
| 20. Syphilis or gonorrhoea ___ | 36. Rheumatic fever ___ |
| 21. Broken bone, serious sprain or
strain, dislocated joint ___ | 37. Any serious accident, injury,
or illness not mentioned
above (Describe under "Remarks"
giving dates). |
| 22. Rheumatism, arthritis, or other
joint trouble ___ | |

REMARKS

I certify that I have not withheld any information and that the above is
accurate to the best of my knowledge.

Signature _____

TO THE PHYSICIAN:

The bearer requests evaluation of his fitness for diving with breathing apparatus. He has completed a medical history form that should assist you. Besides assessment of his history, he requires a good general physical examination. Attention to psychiatric status is also indicated. Other procedures are at your discretion (see below).

Please bear in mind that diving involves a number of unusual medical considerations. The main ones can be summarized as follows:

1. Diving involves heavy exertion. (A diver must be in good general health, be free of cardiovascular and respiratory disease, and have good exercise tolerance).

2. All body air spaces must equalize pressure readily. (Ear and sinus pathology may impair equalization or be aggravated by pressure. Obstructive lung disease may cause catastrophic accidents on ascent).

3. Even momentary impairment of consciousness underwater may result in death. (A diver must not be subject to syncope, epileptic episodes, diabetic problems, or the like).

4. Lack of emotional stability seriously endangers not only the diver but also his companions. (Evidence of neurotic trends, recklessness, accident-proneness, panicky behavior, or questionable motivation for diving should be evaluated).

SUGGESTED ADDITIONAL PROCEDURES:

(at the physician's discretion)

Routine: Chest film (if none within one year), urinalysis, wbc, hermatocrit.

Divers over 40: Electrocardiogram with step test.

Questionable respiratory status: Lung volumes, timed vital capacity.

INOCULATIONS:

Divers often enter polluted water and are subject to injuries requiring anti-tetanus treatment. It is strongly advisable to keep all routine immunizations up to date. (Tetanus, typhoid, diphtheria, smallpox, poliomyelitis).

Blood Pressure _____	Vision uncorrected R 20/ L 20/ corrected R 20/ L 20/
Ears _____	Hearing _____
Nose _____	Throat _____
Heart _____	Lungs _____
Any other abnormal findings _____	

Impression

I have examined _____ and reached the following conclusion concerning his fitness for diving:

_____ APPROVAL

_____ CONDITIONAL APPROVAL. (I do not consider diving in examinee's best interest but find no defects that present marked risk).

_____ DISAPPROVAL. (Examinee has defects that I believe constitute unacceptable hazards to his health and safety in diving).

Signature _____ M.D.

Address _____

Date _____ 19____

MEDICAL EMERGENCIES

Air embolism may occur immediately upon return to surface. Symptoms—unconsciousness, vertigo, **niting**, bleeding from the mouth, neurocirculatory shock. Symptomatic treatment—oxygen therapy, and **mediate** recompression may be indicated.

Decompression sickness (bends) suspected if symptoms occur within 6 hours after diving. Symptoms **y** include pain in joints, muscles, or mediastinum, asthenia, neurocirculatory shock, paralysis, **consciousness**. If severe, recompression may be indicated, oxygen therapy may be temporary benefit. For **medical** counsel or assistance to a physician treating the case call:

School of Aerospace Medicine, Brooks AFB, San Antonio, Texas
536-3278

Ask for the Medical Officer of the Day or the Dysbarism Dut

the telephone operator this is a medical emergency!

The inquiring physician should be prepared to supply the **physician** you contact:

1. Name, age, sex, approximate weight and height.
2. When was the dive—how long ago? What was its profile?
3. What are the symptoms, how severe? When did they occur?

If treatment in the Air Force chamber is contemplated the

1. Has the family or a family physician been consulted?
2. Has the patient been admitted to a hospital and if so where?
3. How is the patient being evacuated to Brooks AFB?
4. When will he arrive there?
5. Is ambulance needed from the air field?