**CHAPTER 28**

**Title: Underwater Diving Safety**

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**Instruction:**This chapter is revised to reflect organizational changes.

**Approving Official:** Jose R. Aragon, Associate Director for Administration

1. **Purpose and Scope**.
2. To specify the minimum Occupational Safety and Health (OSH) program requirements for the scientific diving program.
3. Provide the authority, policy, and responsibility to execute an OSH program covering diving operations conducted by personnel and organizations of, or under the auspices of, the U.S. Geological Survey (USGS).
4. This chapter specifies the minimum requirements for a scientific diving program.  The purpose of these requirements is to ensure that all underwater diving (hereafter referred to as diving), using compressed gas, is conducted in a manner that maximizes protection of divers from accidental injury and (or) illness.
5. These standards encourage and facilitate scientific diving program reciprocity among the Department of the Interior (DOI), other governmental agencies, and academia through sharing of diving expertise and resources.  The chapter provides USGS-specific approaches to diving, tailored to address their unique program mission, research, and resource management requirements.  This chapter also establishes minimum diving, safety, training, equipment, and medical requirements.
6. Diving is defined as any activity taking place underwater using a self-contained underwater breathing apparatus (SCUBA), surface-supplied air, mixed gases, enriched air (such as nitrox), or a rebreathing apparatus.
7. The requirements contained in this chapter are applicable to all diving activities performed by USGS personnel.  The USGS is responsible for ensuring that contracted diving services are conducted in accordance with applicable local, State, and Federal regulations.
8. This chapter is intended for USGS personnel and cooperative divers involved in official activities where any underwater breathing apparatus (other than a snorkel) is used.  All diving operations must comply with the scientific USGS Dive Safety Manual, requiring diver authorization and diving plan approval before a dive takes place.
9. Ensure that the scientific diving program remains in compliance with applicable Occupational Safety and Health Administration (OSHA) regulations and the scientific diving exemption from the commercial diving standards (29 CFR 1910 Subpart T Commercial Diving Operations and Appendix B), as well as the DOI Safety and Health Handbook (DM Part 485).
10. Ensure that the Dive Safety Board has, at minimum, the necessary authority to fulfill all obligations under OSHA regulations.
11. Set forth minimum standards for conducting the scientific diving safety program and fundamental requirements and procedures to assure safety in scientific diving operations through the USGS Dive Safety Manual.  The Dive Safety Manual also establishes a framework for reciprocity for organizations that adhere to these minimum standards for joint scientific projects.
12. **References**.
13. 29 Code of Federal Regulations (CFR) 1910 Subpart T, Commercial Diving Operations and Appendix B.
14. 29 CFR 1910.1020, Access to Employee Exposure and Medical Records.
15. Department of the Interior (DOI) Occupational Medicine Program Handbook.
16. USGS Dive Safety Manual.
17. Survey Manual (SM) 308.66, Specialized Safety Program Committees.
18. 29 CFR 1910.440, Recordkeeping Requirements.
19. **Requirements**.
20. USGS Programs.
21. The USGS ensures that its diving policy is wholly consistent with OSHA requirements specified in 29 CFR 1910 Subpart T (Commercial Diving Operations) as amended and Appendix B (Guidelines for Scientific Diving) to that standard.
22. The USGS establishes and maintains an active scientific diving program.  The program shall include provisions for the establishment of the Dive Safety Board.  The Dive Safety Board meets or exceeds the requirements in 29 CFR 1910 Subpart T, Appendix B, and provides administrative oversight of the scientific program to ensure compliance with OSHA, DOI, and USGS requirements.
23. Organizations that conduct or participate in diving activities included in exemptions authorized under 29 CFR 1910.401(a)(2) shall ensure that such activities are conducted in strict accordance with these exemptions.  For diving activities conducted under the OSHA exemptions, operational safety requirements are established to ensure that equivalent or greater safety precautions are instituted.  These measures are reviewed and approved by the Dive Safety Board.
24. The scientific diving program includes provisions for conducting appropriate dive planning, together with preparation of written diving plans prior to initiating specific diving operations.  Diving plans shall include an activity hazard analysis for each diving assignment/operation.
25. Minimum Diver Requirements. Each diver must:
26. Complete a course and be certified by a nationally recognized dive program/agency.  The training, as a minimum, shall meet the requirements of this section.  The USGS establishes additional training requirements as necessary to ensure that divers are qualified to safely perform their mission.
27. Take a drug test administered in accordance with 370 Departmental Manual (DM) 792.9 and 370 DM 792.10 for which a negative drug test is received prior to appointment.  Once employed, the diver shall be subject to the DOI’s random drug testing program.
28. Undergo a periodic diving medical examination to determine individual’s fitness to dive, as specified in the USGS Dive Safety Manual.  Guidance on medical examinations for underwater divers can be found in the DOI Occupational Medicine Program Handbook.
29. Complete a cardiopulmonary resuscitation (CPR) course, comparable to American Red Cross (ARC), Divers Alert Network or American Heart Association (AHA) Adult CPR, and a nationally recognized first aid course, taught by the ARC or AHA.  Certifications must be current at the time of dive.  Further emergency medical service training in diving-related subjects and oxygen administration is recommended.
30. Make a minimum of 12 logged dives in 12 months with at least one dive in 6 months.  The minimum requirements for a dive are use of an underwater breathing system by the diver and at least a 10-minute surface interval since the previous dive.  Consecutive no-decompression dives with less than a 10-minute surface interval are considered a single dive.
31. Complete a minimum of 40 hours of diving-related training over any 3-year period.
32. Diver physical fitness is determined by the required medical examination and continued diving activities.
33. Equipment Inspection.  All diving equipment used by a diver must be professionally inspected according to OSHA, industry, and (or) manufacturers’ standards.
34. Equipment used in any diving operation, regardless of ownership, shall be maintained in proper order and be tested according to industry and (or) OSHA requirements prior to any dive operation.
35. Records of equipment maintenance and repair shall be maintained for a minimum of 3 years.
36. Recordkeeping.
37. Divers shall maintain a personal dive log of each dive performed (record of dive).  The USGS shall ensure that accurate dive logs are maintained and tabulated on an annual basis.
38. A log of equipment modification, repairs, tests, calibration, and maintenance shall be maintained.
39. Underwater diving safety records identified above shall be retained as required by 29 CFR 1910.440.  Diver medical records shall be maintained in accordance with the requirements of 29 CFR 1910.1020 Access to Employee Exposure and Medical Records.
40. Dive Safety Manual.
41. The USGS develops and maintains a safe practices manual which includes, as a minimum, the following: procedures covering all diving operations specific to the program; procedures for emergency management, including recompression and evacuation; identification and use of appropriate dive tables and (or) dive computers; criteria for diver training and certification; and aviation flight restrictions following dive operations.  The manual includes appropriate operational safety requirements covering, at a minimum, dive team composition, required equipment, use of hand-held tools and equipment, and pre- and post-dive procedures.
42. The Dive Safety Manual provides guidance to personnel conducting diving activities and covers the following:
43. Required procedures for diving under the auspices of the USGS.
44. Emergency rescue and care procedures including onsite treatment, recompression, and evacuation.
45. Criteria for diver training and authorization.
46. Establish operational guidelines for the Dive Safety Board.
47. Personnel shall meet the following certification requirements prior to being assigned diving duties:
48. Hold a current SCUBA certification card (“C” card) issued by an approved national or international underwater diving organization.
49. Pass a comprehensive physical examination as outlined in the Dive Safety Manual.
50. Demonstrate diving proficiency and competence by fulfilling the requirements listed in Chapter 6.1.C of the Dive Safety Manual.
51. Forward copies of the “C” card and dive logs through the Field Dive Officer to the Dive Safety Board for final approval.
52. Forward the original medical examination, medical history, and test results to the appropriate servicing Human Resources office.
53. Hold a current certification in CPR, basic/standard first-aid, and emergency oxygen administration.
54. In order to maintain diving authorization, all divers are required during any 12-month period to:
55. Log the minimum number of dives as required in the Dive Safety Manual to maintain authorization.
56. If a scientific diver’s authorization to dive expires, or is suspended or revoked, the diver may be reauthorized after complying with such conditions as the Dive Safety Officer or Dive Safety Board may impose.  Divers shall be given an opportunity to present their case to the Dive Safety Board before conditions for reauthorization are stipulated.
57. Dive Safety Board.
58. The USGS program includes provision for a Dive Safety Board, with authority over all under water scientific diving, to provide oversight and to ensure a mission-related diving safety program is maintained.
59. The Dive Safety Board, with the majority of its members being active scientific divers, has the authority to approve and monitor diving projects; review and revise underwater diving safety policy; ensure compliance with the Dive Safety Manual; authorize the depths to which a diver has been trained; take disciplinary action for unsafe practices; and ensure adherence to the buddy system (a diver is accompanied by and is in continuous contact with another diver in the water) for SCUBA diving.
60. Addresses all diving safety issues and reviews accidents related to diving, inclusive of making recommendations to prevent recurrence of similar accidents.
61. See SM 308.66 for the Dive Safety Board membership requirements.
62. Specialty and Technical Diving.  Divers engaged in specialty and technical diving including, but not limited to, decompression diving, closed-circuit rebreather diving, mixed gas diving, surface-supplied diving, and high altitude diving or cave diving must establish operational procedures specific to the specialty or technical diving covered.  These procedures are incorporated in the Dive Safety Manual and include specific safety and training requirements needed to comply with OSHA's regulations for commercial diving, with community, and (or) manufacturers’ standards.
63. **Responsibilities**.
64. Director**.**
65. Requires compliance with statutory, regulatory, and dive program criteria.
66. Holds the Designated Agency Safety and Health Official (DASHO), Associate Directors, and Regional Directors accountable for effectively fulfilling dive program responsibilities within region, mission area, or office.
67. Delegates sufficient authority to the DASHO to effectively manage and administer the dive program.
68. Associate Directors and Regional Directors**.**
69. Provide adequate staff and funding resources to effectively implement and administer the dive program within their respective region, mission area, or office.  (Reference 29 CFR 1960.7.)
70. Require compliance with statutory, regulatory, and dive program criteria and hold managers and supervisors accountable for effectively fulfilling dive program responsibilities.
71. Designated Safety and Health Official.  Directs OSH program activities, through the Chief, Office of Management Services, and ensures that adequate staff and funding resources are provided to develop and administer the OSH program.
72. Chief, Office of Management Services.  Provides sufficient authority and resources to effectively support and represent the interests of the USGS in the oversight, management, and administration of the dive program.
73. Occupational Safety and Health Program Manager.
74. Provides administrative support to the Bureau Dive Officer and Dive Safety Board, as appropriate.
75. Provides for establishment of a Dive Safety Board.
76. Participates or designates a representative on the Dive Safety Board.
77. Collaborates with the Scientific Diving Program Manager on staffing levels to determine effectiveness in establishing and implementing the dive program.
78. Specialized Safety Programs Section Chief.
79. Provide Scientific Diving Program oversight, administration, budget coordination and supervision of the Scientific Diving Program Manager.
80. Collaborates with Scientific Diving Program Manager on dive program policies, goals, and annual program plans and accomplishments.
81. Serves as the OSH program manager designee on the Dive Safety Board.
82. Provides support, oversight, and supervision for the Scientific Diving Program Manager.
83. Scientific Diving Program Manager.
84. Serves as the Dive Safety Officer and is an authorized USGS diver.
85. Serves as the Dive Safety Board Chair.  Coordinates meetings and agendas and publishes minutes.
86. Assists in the drafting of new or revised standards for diving safety programs.
87. Coordinates with the Dive Safety Board to compile a fiscal year diving safety program action/accomplishment plan and submit annually to the DASHO through the OSH Program Manager.
88. Completes a diving safety program policy self-assessment annually.
89. Provides advice and works with other DOI Dive Safety Boards to develop DOI policy and underwater diving safety standards.
90. Provides technical scientific diving expertise and assistance in support of mission-related underwater research.
91. Performs external safety audits of diving safety programs and documents within the Inspection and Abatement System.
92. Oversees and updates diving safety program Web site.
93. Dive Safety Board.
94. Approves Regional Director appointments of Regional Dive Safety Officers.
95. Reviews and revises the Dive Safety Manual as required to maintain currency.  Reviews and revises SM 445-2-H.28 Underwater Diving Safety.
96. Submits dive program Web page content and reviews documents and protocols/charters, as appropriate.
97. Supports the Occupational Safety and Health Management Branch in the investigation of all dive safety accidents/incidents (i.e., inquiring into the nature and cause of all diving related accidents/incidents), and reports of noncompliance with the Dive Safety Manual and provides recommendations for corrective action.
98. Establishes and approves training programs and authorization requirements for divers.
99. Coordinates with mission area and Regional Safety Managers on training and dive operations.
100. Advises the DASHO and OSH Program Manager on matters of diving policy.
101. Develops and maintains diving information management systems, with assistance from regional and Bureau safety managers.
102. Reviews the latest diving technology and procedures and disseminates information to the diving community through appropriate organizational contacts.
103. Regional Dive Safety Officers.
104. Serve as members of the Dive Safety Board and are authorized USGS divers.
105. Assist in the drafting of new or revised standards for diving safety programs.
106. Provide interpretations of regulations and requirements.
107. Provide technical assistance to Field Dive Officers, supervisors, and local dive operations with regards to the use of safety protocols and equipment.
108. Complete diving safety program policy self-assessments annually.
109. Coordinate dive training when requested by Field Dive Officers and individual dive teams within their regions.
110. Work with the Dive Safety Board to establish and approve additional training requirements as necessary to ensure that divers within their regions are qualified to safely perform their missions.
111. Perform check-out dives at facilities where there are no Field Dive Officers or the Field Dive Officer is unavailable.
112. Work with the Dive Safety Officer to ensure that authorized divers in their region are in compliance with the diving safety program and the Dive Safety Manual.
113. Perform external safety audits of diving safety programs and enter dive safety audits into the Inspection and Abatement System.
114. Write Letters of Reciprocity for authorized divers that dive with another agency or institution.
115. Approve dive plans when needed.
116. Maintain records of divers and diving activities within their regions.
117. Ensure that properly prepared diving plans, including specialized diving hazard analyses, are written for each dive project in their regions.
118. Assist in annual reviews of and (or) revisions of the Dive Safety Manual.
119. Regional Safety Managers.  Provide support and assistance to field organizational Collateral Duty Safety Program Coordinators (CDSPCs) and Field Dive Officers in establishing and implementing dive safety program requirements and training.
120. Science Center Directors, Cost Center Managers, and Project Chiefs.
121. Ensure that current diving authorizations are maintained as outlined in the Dive Safety Manual for all USGS and cooperative divers under their direction.
122. Ensure that all diving operations under their jurisdiction are conducted in accordance with the requirements of this chapter and the Dive Safety Manual.
123. Ensure that dive plans are submitted through the local CDSPC to a member of the Dive Safety Board or a Field Dive Officer authorized to approve dive plans, with a copy to the Regional Dive Safety Officer or Dive Safety Officer, when applicable.
124. Field Dive Officers.
125. Review and approve all dive plans to ensure compliance with requirements set forth in this chapter and the Dive Safety Manual.
126. Provide advice and guidance to local diving projects.
127. Advise local management and the Dive Safety Board, as appropriate, of unsafe diving practices discovered through a review of accident and incident reports or by supervisor requests.
128. Transmit records to the Dive Safety Officer for the preparation of the annual report to the DASHO through the OSH Program Manager.
129. Participate in local safety committees.
130. Maintain records of local divers, diving activities, and dive plans.
131. Collateral Duty Safety Program Coordinators.
132. Assist in coordinating approval of local dive plans.
133. Maintain approved plans and provide copies to the Regional Dive Safety Officer, as applicable.
134. Lead Diver.  One member of the dive team is designated as lead diver.  The lead diver acts as the Dive Safety Officer’s representative on each dive.
135. Individual Diver(s).  As a member of the dive team, the individual diver is responsible for his/her own safety, the safety of the other team members, and compliance with the Dive Safety Manual requirements.
136. **Additional Resources.**
137. Internal diving program page.
138. http://www.diversalertnetwork.org.
139. National Oceanic and Atmospheric Administration (NOAA) Diving Manual, (available through, http://www.bestpub.com).
140. http://www.aaus.org.

CHAPTER 28, APPENDIX A

**Underwater Diving Safety – Recordkeeping 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, Education and Welfare, or 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 (11910.420) - 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) Equipment inspections and testing record (1910.430) - current entry or tag, or until equipment is withdrawn from service;

(vi) Records of hospitalizations (1910.440) - 5 years.

(4) After the expiration of the retention period of any record required to be kept for 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, Education, and Welfare.