

DEPARTMENT OF THE ARMY  
U.S. Army Corps of Engineers  
Washington, DC 20314-1000

ER 385-1-86

CESO

Regulation  
No. 385-1-86

20 September 2010

Safety  
U.S. Army Corps of Engineers Dive Program

1. Purpose. This regulation prescribes policies, program responsibilities, and qualification of personnel for underwater diving operations performed by U.S. Army Corps of Engineers employees. USACE Dive personnel shall follow the technical safety requirements for diving found in the USACE Safety & Health Requirements Manual EM 385-1-1.

2. Applicability. This regulation is applicable to HQUSACE elements, major subordinate commands (MSC), districts, and ERDC who conduct diving operations performed by government employees. This regulation outlines Dive Program Management requirements; USACE dive teams shall also follow the technical dive safety requirements of the USACE Safety and Health Requirements Manual, EM 385-1-1.

3. References.

- a. 29 CFR 1910, Occupational Safety & Health Standards.
- b. EM 385-1-1, Safety & Health Requirements Manual.
- c. U.S. Navy Diving Manual, Most Recent Volume. (U.S. Navy)
- d. The Physician's Guide to Diving Medicine (1984), Plenum Press, New York and London
- e. FAA Website Directory for Aviation Medical Examiners

4. Responsibilities.

a. Chief of Engineers (CG). The CG, through the HQUSACE Safety and Occupational Health Office, is responsible for establishing diving safety policy for all Government and contractor diving activities conducted by the Corps of Engineers. The HQUSACE Safety and Occupational Health Office (CESO) Chief will designate a USACE National Dive Safety Program Manager who will promulgate and provide program and training guidance to all USACE elements.

b. MSC/ Division Commanders. The MSC commander is responsible for program management and quality assurance of all Government and contractor diving activities conducted within their division. The Division Commander will appoint, in writing, a Designated Dive Coordinator (DDC) to assure appropriate division oversight of the dive safety program. The MSC DDC will provide program guidance and will review subordinate dive programs on a frequency as determined appropriate by the MSC DDC. An Alternate MSC DDC (ADC) will perform these duties in the absence of the DDC. MSCs with limited or no expectation of diving operations may establish a written regional support agreement with the DDC of another USACE MSC in lieu of developing their own qualified personnel, and such agreement will include adequate funding to assure the regional resource personnel can maintain their required certifications.

c. District/ Field Operating Activity (FOA)/ Lab Commanders. The Commander of each District/FOA/ Lab with Government or contractor diving activities is responsible for managing a diving safety program in compliance with this regulation. The commander will appoint, in writing, a Designated Dive Coordinator (DDC) and ADC to organize, integrate and monitor the dive program. During Dive Operations, the DDC has ultimate authority on behalf of the Commander over the conduct of work, to include stopping work when they judge that hazards pose an unacceptable risk. Organizations with limited or no expectation of diving operations may establish a written regional support agreement with the DDC of another USACE Command in lieu of developing their own qualified personnel.

d. District/ FOA/ Lab DDC. The District/FOA/Lab DDC is the Commander's primary technical authority for the dive program. Specific duties and responsibilities include:

(1) Develop and oversee local dive program policies and procedures, review government and contractor safe practices manual(s), dive plans and hazard analyses, medical certificates, and dive team qualifications and experience to assure compliance with this regulation and EM 385-1-1 Section 30.

(2) Attend, or designate ADC, Dive Safety Representative (DSR), or Dive Inspector attendance, at all contractor pre-dive meetings.

(3) Verify the qualifications and experience of dive team personnel, to include divers-in-training, divers, diving supervisors, and tender(s), prior to commencement of dive operations. Diver's log books will be included in this review. Responsibilities for in-house dive teams include authorizing dive team member placement and advancement as well as recommending removal from the dive program.

(4) Review the performance of in-house Dive Supervisors and dive team personnel and report to their supervisory chain and the Commander on their performance. The DDC will evaluate duty status of all dive team members based on recommendations by Dive physicians, health professionals, and Dive Supervisors and will remove those deemed unfit from duty status.

(5) Review dive contractor submittals and provide acceptance/ non-acceptance to the Contracting Officer or Representative.

(6) Oversee dive operations in the field through personal on-site evaluations, reports of dive inspectors, Safety Office site evaluations, and coordination with dive supervisors.

(7) Coordinate all dive program policies and activities with the Command Safety Office.

(8) Halt dive operations when they are deemed unsafe.

(9) Generate and file a "letter of authorization" for each dive team member, Dive Inspector, and DSR listing the duties they are authorized to perform.

(10) The ADC will perform these duties in the absence of, or as designated by, the DDC.

e. MSC/ District/ Lab SOH Diving Safety Office. The MSC, District, FOA and Lab Safety and Occupational Health Office (SOHO) will assign a Dive Safety Representative (DSR). Where Safety Office participation in the Diving Safety Program is infeasible due to infrequency of dive operations, lack of safety staff, or other factors, the appropriate MSC/ higher headquarters Commander may waive the requirement for the DSR at the written request of the specific FOA Commander. The duties and responsibilities of the DSR include:

(1) Provide diving safety advice to the DDC and operational elements.

(2) Review and comment to the DDC on local dive program policies and procedures, government and contractor safe practices manual(s), dive plans and hazard analyses, medical certificates, and dive team qualifications and experience to assure compliance with this regulation and EM 385-1-1 Section 30.

(3) Perform on-site assessments and/ or monitoring of diving operations to evaluate effectiveness of safety controls and procedures and report findings to the Chief, SOHO and the DDC.

f. Dive Inspector. The Dive Inspector is the on-site representative of the DDC for contractor dive operations. The objective of the Dive Inspector is to ensure dive team safety. To ensure this, the Dive inspector will work with the contractor and provide recommendations to correct flaws in the dive plan, AHA, or observed diving procedures. Dive Inspector duties and responsibilities include:

(1) Attendance and participation in the contractor onsite pre-dive meeting. Will conduct walk-through of site to evaluate staging areas, equipment condition and setup, and measures taken to protect against hazardous energy and external operations.

(2) Compare personnel on site against approved list submitted to the DDC to assure only accepted personnel are on the dive operation.

(3) Monitor and evaluate contractor dive operations for compliance with the accepted dive plan, EM 385-1-1 and other applicable regulations. Will halt unsafe dive

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operations and work with the DDC and contractor to develop acceptable procedures. Reports to the DDC on safe practices and hazard conditions regularly during the dive operation and coordinates DDC instructions with the contractor.

g. Diving Supervisor. The Dive Supervisor is the primary operational authority on a dive team's operations. Each USACE dive team operation will have a diving supervisor designated to manage all aspects of the diving operation that affect the safety and health of dive team members. In-house Dive Supervisors will be appointed and maintain current status only with concurrence of the DDC. For In-house dive operations, the Command shall establish policies and procedures to prevent potential operational supervisory pressure on the Dive Supervisor that would compromise their safety management role. Dive Supervisors control the dive operation; other than the DDC/ ADC, local duty supervisors and management shall not interfere with their decisions relative to the dive unless recommending more stringent safety measures. Dive Supervisor duties and responsibilities include:

(1) Dive team qualifications and training verification prior to operations. Will provide training and guidance to tenders and Divers-in-Training.

(2) Dive plan development, dive site coordination, set-up of staging area and equipment areas, pre-dive meetings, personnel duty assignment for dive team, equipment inspection and selection.

(3) Supervision of dive operation to include diver scheduling and nitrogen/decompression maintenance, work task completion, lock-out tag-out/ control of hazardous energy, controlling external hazards to the dive location (navigation, equipment operation, etc.), emergency response, and demobilization of dive site.

(4) Provide completed dive logs and mission completion reports (if applicable) to the DDC and management. Report all injuries and accidents to the District Safety and Occupational Health Office. Report hazardous conditions/ events, near misses, and other lessons learned to the DDC and the Dive Safety Representative.

(5) Monitor Dive team members' apparent physical/ mental fitness and ability to perform their assigned tasks. When a suspected problem arises, the Dive Supervisor will prevent the team member from performing diving or hazardous tasks and will recommend to the DDC that the diver be reevaluated to determine if they should be temporarily or permanently removed from USACE Diver duties. Physical and mental fitness will be assessed by an appropriate physician; ability to perform assigned tasks will be assessed by a committee consisting of the DDC/ ADC and diving supervisors who will evaluate such factors as safety performance, attention to proper procedures, technical knowledge, etc.

(6) Limitations: For the duration of dive operations at a site, no facility equipment, cranes or vessels that may impact the dive operation will be moved or operated without the permission of the Dive Supervisor. The Dive Supervisor will ensure all related tasks, including lock-out tag-out procedures, are adequate and performed within the guidelines of the USACE Safety and Health manual, EM 385-1-1, and the Control of Hazardous

Energy policy, ER 385-1-31. The Dive Supervisor will remain topside, on-site, and in overall control of the diving operation. They will not assume duties of diver or standby diver while acting as Dive Supervisor. They may rotate into a diver or standby diver position only if there is another competent, fully qualified dive supervisor on the dive team, and the management transition is clearly made.

h. Divers. Divers and Divers-in-Training shall be:

(1) Medically fit to dive as attested by a Diving Physician, Aviation Medical Examiner or other licensed physician trained in hyperbaric medicine on an annual basis. A fitness for duty letter from the Physician must state that the Doctor is experienced with and/ or knowledgeable of the specific requirements of dive medicine, hyperbaric medicine, or similar applicable medical fields and that the individual is cleared for diving activities. After any serious injury or illness, divers shall be re-examined by a physician and reapproved for diving duties.

(2) Trained to be fully knowledgeable of prescribed safety procedures, including the use of all equipment and/or tools necessary to safely perform assigned tasks, certified in accordance with this regulation, and able to demonstrate this knowledge.

(3) Physically and psychologically fit to the extent needed to perform their duties. The diver is responsible for monitoring their own health and condition and will report any known or suspected limitations to the Dive Supervisor. The diver shall report to work well rested and in good physical and mental condition.

i. Tenders and other Dive Team Members. Tenders, communications operators, and other dive team members will be:

(1) Mentally and physically capable of performing their required tasks.

(2) Knowledgeable of their duties and skilled at the tasks required of them.

(3) Responsive to the directions of the Dive Supervisor and the needs of divers.

## 5. Training and Qualifications

a. USACE Approved Program.

(1) All Dive Team members shall have current training and certification in CPR/First Aid.

(2) For FOAs with USACE divers, qualified DDC candidates must have a minimum of 3 years experience as a USACE Dive Supervisor or equivalent, and ADC candidates must have 2 years experience in the same. Currently designated DDCs and ADCs at the time of this publication will be considered qualified. The DDC and the alternate shall, as a minimum, successfully complete the HQUSACE-approved Diving Safety/ Diving Supervisor Training Course and shall maintain certification by attending the diving refresher course every 4 years. DDCs attending the Diving Safety Course are not required

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to perform 12 working/training dives unless they are in a dual position as a USACE diver or USACE Diving Supervisor. If a DDC/ADC from an organization with USACE Divers will also oversee contract dives, they must attend the Dive Safety Administrator Initial Course once, but are not required to take future refreshers unless switching to contractor-only dive operations.

(3) In all MSCs and in those FOAs where all diving is performed by contractors, qualified DDC Candidates must have 3 years experience as a USACE Dive Inspector or Dive Supervisor or equivalent and ADC candidates must have 2 years experience in the same. Currently designated DDCs and ADCs at the time of this publication will be considered qualified. The DDC and ADC for “contractor-only dive” FOAs must have successfully completed a USACE Diving Safety/ Diving Supervisor, Diving Inspector, Diving Coordinator or Dive Safety Administrator course and shall maintain certification by attending the USACE Dive Safety Administrator refresher every 4 years. Diving inspectors must have successfully completed a USACE Diving Safety/ Diving Supervisor, Diving Inspector, Diving Coordinator or Dive Safety Administrator course and shall maintain certification by attending the USACE Dive Safety Administrator refresher every 4 years.

(4) The DSR must successfully complete the USACE Diving Safety/ Diving supervisor, Diving Inspector, Diving Coordinator or Dive Safety Administrator course and maintain certification by attending the appropriate HQUSACE-sponsored refresher course every 4 years. Unless required by position, this individual is not required to perform 12 working/ training dives to maintain certification.

*NOTE ON USACE COURSE CHANGES IN 2009:*

*The 72-hour Diving Coordinator class became the initial Dive Safety Administrator Course, intended as initial training for “Contract-only diver” DDCs, ADCs, Dive Inspectors, and DSRs.*

*The 40-hour Diving Inspector Course became the refresher course for Dive Safety Administrator. There is no separate Dive Inspector course; inspectors must take the DSA Courses*

*The Diving Safety/ Dive Supervisors Courses remain the same for in-house USACE divers and supervisors.*

(5) All USACE Divers and/or Dive Supervisors shall be trained in a HQUSACE-approved Working Diver Safety/ Dive Supervisor training program. Upon completion of initial dive safety and/or supervision training, the participant will be certified to dive and/or supervise dive operations. NOTE: Although certified, the participant must still be issued a letter of authorization by the DDC to perform diving and/or diving supervision activities.

(6) Tenders shall have training as a USACE Diver, Dive Supervisor, or locally trained as a tender. Districts/ FOA/Labs will provide formalized training for dive tenders who have not completed a Dive Safety Course as a Diver or Dive Supervisor. All tenders who will become divers-in-training shall have received basic SCUBA certification from a

nationally accredited diving course. The local training will encompass all pertinent aspects of tending in order to provide safe and efficient support to divers. Tenders receiving on-the-job training shall be utilized only under the supervision of a trained and qualified dive team member. Tender training duties will be documented and consist of at least the following:

- (a) Line pull signals
- (b) Emergency response for diving injuries
- (c) Surface supplied gear setup and maintenance
- (d) Radio communication procedures
- (e) Dive related documentation
- (f) Repetitive dive time calculations
- (g) Underwater tool safety procedures

(7) Successful completion of the training will be determined by the DDC and/ or a panel of dive supervisors. Upon successful completion of the Dive Tender training and recommendation by the Dive Supervisor, the DDC will file a letter of authorization for tending duties.

(8) For those USACE organizations which solely conduct scientific diving operations, specialized training programs may be approved by the HQUSACE Dive Safety Program Manager on a case-by-case basis.

b. Proficiency. Once trained, certified and authorized to dive and/or supervise diving activities, the Diver and/or Dive Supervisor must maintain currency and demonstrate proficiency according to the following schedule:

(1) Diver only: Employee must perform no less than 12 working or training dives each year. The annual required time period shall commence upon completion of a HQUSACE-approved Working Diver Safety and Supervision Course or Diving Safety and Supervision Refresher Course. Working or training dives should be distributed throughout the year to maintain optimum diver proficiency. Divers not performing 12 dives annually will have their letter of authorization suspended, but will have 6 additional months to make them up as training dives only. Upon completion of the remaining dives within that time period, the letter of authorization may be reinstated. If the remaining dives are not completed within that period, the employee must attend a HQUSACE approved Diving Safety and Supervision Refresher course before the letter of authorization to dive can be reissued.

(2) Supervisor only: Employee must plan, execute and supervise no less than three diving operations each year. A dive operation will be considered to be the complete scope of work addressed in a single diving plan. When large-scale dive projects are

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performed for a number of similar tasks but using the same dive plan revised for each individual task/ location, each sub-task may be considered a separate operation (example: Dive operations to replace a number of similar trash screens in different locations on a structure over a 4-week period – each separate screen or group of screens could be considered a separate operation). The annual required time period will commence upon completion of a HQUSACE-approved Working Diver Safety and Supervision Course or Diving Safety and Supervision Refresher Course. Employees not supervising 3 diving operations annually will have their letter of authorization suspended and must attend a HQUSACE-approved Diving Safety and Supervision Refresher Course before the letter of authorization to supervise diving operations can be reissued.

(3) Diver and supervisor: Employee must perform no less than 9 working or training dives each year, and must plan, execute and supervise no less than 2 diving operations each year. The annual required time period shall commence upon completion of a HQUSACE-approved Working Diver Safety and Supervision Course or Diving Safety and Supervision Refresher Course. Employees not performing 9 dives annually will have their letter of authorization suspended, but will be given an additional 6 months to make up the dives as training dives only. Employees not supervising 2 diving operations annually will revert to diver-only status, and must make 12 working or training dives during the year to maintain that status.

c. Diver-in-Training Developmental Program. The Diver-in-Training (DIT) Developmental Program is intended to determine the suitability of an individual for certification as a Corps diver. The candidate must be certified as a SCUBA diver by a nationally recognized SCUBA certification organization prior to designation as a Diver-in-Training. Dives made by a Diver-in-Training are restricted to a maximum depth of 33 feet, and must comply with the following:

(1) The Diver-in-Training will be designated in writing by the DDC and must remain on active training status for a minimum of 6 months and a maximum of 18 months or show proof of equivalent military/commercial diving experience or training. During this period, he/she must complete the formal Tender training, be involved with a minimum of 10 diving operations, and show proficiency for diving work. If the training status must be extended, the DDC may do so in writing in 6- month intervals. Prior to performing any underwater training dives in the working environment, the Diver-in-Training will be given practical training in the safe setup and use of the specific equipment, Surface-Supplied or other, worn by the dive team by a professional instructor, dive supervisor, or diver knowledgeable in the proper use of the equipment. This initial training shall include diving in the specific gear, which will be conducted in a safe location under controlled conditions established by the supervisor and the DDC. The DDC will release the Diver-In-Training for participation in working dives only after he/ she shows proficiency in basic use and operation of the equipment.

(2) After the initial equipment training, the Diver-in-Training may perform underwater work as a second diver when accompanied by a qualified diver. This must be performed using the same equipment as the diver and he/she shall be in direct communication with the dive supervisor at all times. During these training dives, a fully equipped standby diver will be stationed topside, as in routine operations, and an



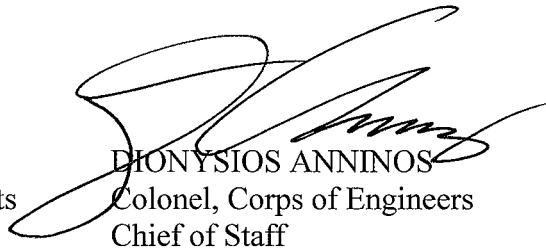
additional tender will be assigned to tend the trainee. The qualified diver will enter the water first and exit the water after the Diver-in-Training is safely topside.

(3) The Diver-in-Training will be considered as an addition to the minimum dive team manning level as required in Appendix O of EM 385-1-1 while in training status. Upon successful completion of the Tender training, the Diver-in-Training may be counted as a Tender if they will perform tending duties.

(4) The physical fitness, psychological fitness and mechanical abilities of Divers-in-Training will be evaluated by the DDC and/or a committee of diving supervisors to determine if they should continue to the Corps Diver level.

FOR THE COMMANDER:

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DIONYSIOS ANNINOS  
Colonel, Corps of Engineers  
Chief of Staff

APPENDIX A

Diving Medical Requirements For Government Personnel

1. A negative response to any of the following physical requirements may restrict or limit occupational exposure to hyperbaric conditions depending on severity, presence of residual effects, response to therapy, number of occurrences, diving mode, or degree and duration of isolation. These items, to include recommendations, will be included in the physician's report of medical examination.

a. Height and weight. The diver examination must contain an evaluation of muscular development and lean muscle mass in reference to capability to perform the tasks described on the SF 78, including the indicated functional requirements and environmental factors.

b. Ears, nose and throat. Audiometric testing must be carried out on every prospective diver. A hearing loss of 35dB or more at frequencies up to 3000 Hz and 50dB or more at frequencies above 3000Hz to a minimum of 6000Hz is an indication for referral of the person to a specialist for further opinion.

(1) Anatomic abnormalities such as perforated eardrums with marked scarring or thickening of the drum are not in themselves disqualifying.

(2) Inability to equalize pressure on both sides of the eardrum is disqualifying.

(3) Acute or chronic suppurative infection of the nose and sinuses may be disqualifying dependent on severity.

(4) Acute or chronic semicircular canal disease will disqualify a diver.

c. Eyes. Vision testing should be carried out on every prospective diver. Vision at distance should be 20/30 in best eye with correction.

d. Cardiovascular system. Severe valvular disease, cardiac arrhythmias, angina, uncontrolled hypertension, severe peripheral vascular disease should disqualify a diver. Any operations performed to correct the above condition should also disqualify a diver.

e. Pulmonary. A history of spontaneous pneumothorax, bleb disease, significant asthma, clinically apparent TB, or significant scarring from TB, cystic disease, emphysematous bullae should all be considered disqualifying.

f. Gastrointestinal system. Gastrointestinal illness that produces chronic illness or debilitation shall be disqualifying unless further evaluated. A clinically apparent inguinal, femoral, large umbilical or incisional hernia should disqualify the diver until it has been repaired. Hiatal hernias are not disqualifying unless the severity of their symptoms affect the diver's ability to work.

g. Central nervous system. Disorders of the vestibular system or a history of seizures are disqualifying. Any history of significant psychoneurotic disorders is disqualifying.

h. Endocrine system. Persons with severe diabetes shall be disqualified unless further evaluated.

i. Musculoskeletal. A history of aseptic necrosis of the head of the femur, the shoulders or the knees is disqualifying.

j. Hematological. Laboratory evidence of sickle cell disease or trait is disqualifying.

k. Genitourinary system. Any significant disease of the kidney which has a systemic effect is disqualifying.

l. Behavior. A history of drug or alcohol abuse may be disqualifying.

2. Recommended Examination.

a. Pre-employment.

(1) Central nervous system.

(2) Musculoskeletal with X-Ray of knees, shoulders, and head of femur.

(3) Ears, nose and throat with audiogram.

(4) Eye examination with vision screening.

(5) Cardiovascular with EKG.

(6) Pulmonary evaluation with chest film.

(7) Gastrointestinal evaluation with check for hernias.

(8) Laboratory.

(a) Sickle Cell testing.

(b) SMA – 12

(c) CBC with differential

(d) Urinalysis

b. Annually. The diver must receive a complete physical as above with the exception of Musculoskeletal X Rays, a chest film and Sickle Cell testing. Musculoskeletal X Rays and Sickle Cell testing need only be done during the initial physical.

c. Tri-annually. The diver must receive an updated chest film.

APPENDIX B

Sample Dive Log, For Illustration Purposes Only  
*Local Reproduction Authorized*

<b>Diver:</b>			<b>Date:</b>			<b>Location:</b>		
<b>Tender:</b>			Weather	<input type="radio"/> Wetsuit <input type="radio"/> Drysuit	Current	<b>Work</b> <input type="radio"/> Moderate <input type="radio"/> Heavy	Bottom Type	
<b>Dive Mode</b>		<b>Air Supply</b>			<b>Backup</b>		<b>Temperature</b>	
Surface air					Cascade and Bailout Bottle		Air	Water
Superlite	Other	Compressor	Cascade	Other		Other		
<b>Dives</b>								
			1	2	3	4	5	6
Time In								
Time Leaving The Bottom								
Time Out								
Bottom Time								
Maximum Depth of Dive								
Repetitive Dive Group								
Surface Interval Prior to Dive								
Repetitive Dive Group After Surface Interval								
Residual Nitrogen Time From Previous Dive								
Total Bottom Time								
<b>Work Accomplished:</b>								
<b>Dive Inspector</b>				<b>Dive Supervisor</b>				