APPENDIX N
RESPIRATOR PROGRAM GUIDELINES

1. Purpose. To prescribe requirements and procedures for the selection, use, care, and maintenance of respirators.

2. Applicability. This appendix applies to all elements of the Jacksonville District, both military and civilians. Contractors are required to submit an SOP (Standard Operating Procedure) on the proper use and handling of respirators (For contractors requirement see EM 385-1-1 and Title 29 CFR 1910.134).

3. References.

a. 29 CFR 1910.134, OSHA Standard for Respiratory Protection.

b. AR 40-5, Health and Environment.

c. ER 385-1-90, Respiratory Protection Program.

d. CESAD Supplement 1, ER 385-1-90, Sep 85.

e. TB MED 502, Respiratory Protection Program.

f. EM 385-1-1, General Safety Requirements.

g. ANSI Z88.2, Practice for Respiratory Protection.

h. AR 11-34, The Army Respiratory Protection Program.

4. Background. When working with toxic materials, it has long been recognized that the respiratory tract is the most important route by which toxic substances enter the body. Most industrial poisonings are caused by inhaling toxic substances. The primary effort to control such hazards should be in the form of engineering controls, such as specially designed ventilation systems. If engineering controls cannot be implemented, or are cost prohibitive, infeasible, or inadequate, respirators must be used to protect the individual whenever hazardous conditions exist. A respiratory protection program shall be established and implemented in accordance with ANSI Z88.2, and the Joint NIOSH/OSHA Standard Completion Program Respirator Decision Logic and Appendix N of EM 385-1-1. This program encompasses training, maintenance, care and awareness of the limitations associated with various types of respirators.

5. Responsibilities.

a. Each Area/Resident/Project Office shall become familiar with the respiratory protection program as outlined in this appendix. A copy of the program shall be maintained in the local office.

b. All supervisors shall:

(1) Request assistance from the S&OH Office in conducting atmospheric testing of area to determine if employees are exposed to contaminant levels in excess of the threshold limit values (TLV) and permissible exposure limits(PEL).

(2) Request assistance from the S&OH Office for fit testing of respirators.

(3) Enforce the use of respirators by employees. Written documentation of employees failure to wear respirators shall be cause for disciplinary action and shall be forwarded to the S&OH Office for inclusion in the employees medical records.

(4) Ensure all employees are trained in the proper use of respirators and report to medical surveillance examinations.

(5) Determine that compressed air breathing system alarms are tested prior to use in potentially IDLH (Immediately Dangerous to Life or Health) situations.

c. All employees shall:

(1) Wear and maintain respirators as required.

(2) Notify supervisors of any problems with respirators or if having respiratory problems.

(3) Report for training and medical surveillance examinations.

d. The Health Unit shall:

(1) Ensure supervisors are notified of employees annual physical.

(2) Ensure proper medical examination requirements are followed, i.e., Pulmonary Function test, etc.

e. Safety and Occupational Health Office shall:

(1) Ensure all respirators are approved by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA). Bureau of Mines (BM) approved Self-Contained Breathing Apparatus (SCBA) and Gas Masks may continue to be used until stocks are exhausted, if they meet current requirements for the specific hazard. The current "NIOSH Certified Equipment List" provides information on what is the appropriate respirator to use, and if the respirator is approved. This publication is available at the S&OH Office.

(2) Provide oversight to ensure compliance with the Respiratory Protection Program.

6. Program Requirements.

a. Respirators/canisters shall be selected according to the hazards to which the worker is exposed, this program means project personnel must know which type of respirator/canister to use in each particular situation. For guidance refer to EM 385-1-1, Appendix N or Section 1 of this appendix.

b. Supervisors shall be instructed in the proper use of respirators and their limitations. Respirators designed for protection against one hazard may be totally ineffective against another.

c. Employees shall ensure respirators are regularly cleaned, disinfected, and stored in a convenient, clean, and sanitary location.

d. The compressor for supplying air for breathing shall be equipped with necessary safety and standby devices; this means that if an oil lubricated compressor is used, it shall have a high temperature, equipment failure and carbon monoxide continuous monitoring alarm, a particulate filter, an activated charcoal canister for organic vapors and an oil moisture separator. All air line couplings must be incompatible with outlets for other gas systems. On all gasoline and diesel compressors, the exhaust and inlet ducts shall be separated by a minimum of 10 feet.

e. Employees shall be trained in the care of their respirator. Training shall include the following: Inspection for defects, cleaning and disinfection, repair, and storage.

f. Prior to initial use, supervisors shall have breathing air for respirators supplied from cylinders or air compressors tested and shall comply with the following specifications for Grade D air: Oxygen 19.5-23.5 %, Hydrocarbons less than 5 Mg/cubic meter, Carbon Monoxide less than 20 ppm, and Carbon Dioxide less than 1000 ppm. Oxygen must never be used with air-line respirators or in apparatuses that have previously contained or used compressed air.

g. Cylinders shall be visually inspected by supervisors in accordance with DOT requirements contained in 49 CFR parts 171-179 and 14 CFR part 103. Where DOT is not applicable, the inspections shall be conducted in accordance with Compressed Gas Association Pamphlets C-6 and C-8.

h. Supervisors shall not assign personnel to tasks requiring the use of respirators unless it has been determined that they are medically able to wear respirators while performing their work. See paragraph 10 of this appendix.

7. Training Requirements and Use of Respirators.

a. Supervisors as well as employees must know which respirators and cartridges are to be used in each situation. This must also be outlined in the form of written procedures (Refer to EM 385-1-1, App. N and TB MED 502). Contact the S&OH Office when assistance is necessary as new operations or projects develop.

b. An additional person must be present in areas where the failure of a respirator could result in the wearer being overcome by a toxic or an oxygen deficient atmosphere. Communications (visual, voice, or signal line) will be maintained between both or all individuals present.

c. Supervisors shall ensure that their employees have an opportunity to handle the respirator, have it fitted properly, test its seal, and familiarize themselves with the respirator by wearing it at periodic training sessions.

d. It must be stressed that respirators shall not be worn when a good fit can not be achieved. A good fit cannot be achieved by anyone who has a beard, long sideburns, a long mustache, or stubble. Facial hair does not effect the fit of an air-supplied hood respirator. Also, the absence of dentures can effect the fit of a face piece.

e. If air line respirators are used, the supplied air source shall not be able to be expended and the hose length cannot exceed 300 ft. from the source to the user.

f. The wearer of any type respirator shall not be allowed to wear contact lenses. If a spectacle, goggle, face shield, or welding helmet must be worn with a face piece, it shall be worn so as not to adversely effect the seal of the face piece to the face.

8. Maintenance, Care, and Storage.

a. All respirators shall be inspected by the employee for defects before and after each use and at least monthly to assure it is in good working order. The inspections shall include a check of the tightness of the connections and a check of the face piece, valves, connecting tube, canister, and cartridge. All rubber and elastic parts must be inspected for pliability and signs of deterioration.

b. Self-contained breathing apparatus shall be inspected by the employee monthly. Air cylinders shall be fully charged according to the manufacturers instructions.

c. A monthly record shall be kept by the supervisor of inspections and findings for respirators maintained for emergency use. Respirators intended for emergency use must be clearly accessible and stored in compartments built for such purposes; such compartments should be clearly marked.

d. If respirators are used regularly, they may be assigned to individual workers for their exclusive use.

e. Respirators shall be regularly cleaned and disinfected. Those issued for the exclusive use of one worker shall be cleaned after each days use. Those used by more than one person shall be thoroughly cleaned and disinfected after each use. To clean and disinfect respirators, they should be washed with detergent in warm water using a soft brush, rinsed thoroughly in clean water, rinsed in a disinfectant solution, rinsed again in clean water (to prevent skin irritation), and air-dried in a clean place. Cleaner and sanitizer solutions that clean effectively and contain bactericide are also available.

f. After inspection, cleaning, and necessary repair, respirators shall be stored in sanitary locations to protect against dust, sunlight, heat, extreme cold, excessive moisture,

and damaging chemicals. It is useful to store non-emergency respirators in plastic bags after they have been cleaned and disinfected.

g. Defective respirators shall be tagged and removed from service by the supervisor.

h. Respirators shall not be stored in tool boxes and lockers unless they are in carrying cases or other protective containers.

i. When stored, the face piece and exhalation valve must be in an upright or resting position. If stored in a bent, folded, or abnormal position, the face piece and exhalation valve can warp or become deformed and thereby void the NIOSH/MSHA APPROVAL.

9. Identification of Respirators, Canisters, and Cartridges.

a. Most manufacturers use the following guidelines when designing their product; therefore, while the identification information given below is necessary to know, it is usually not of major significance to the purchaser. Assistance in ordering specific respirator equipment may be obtained from the S&OH Office.

b. The primary means of identifying gas mask canisters should be by use of properly worded labels. Each canister shall have bold letters stating "Canister for (name of contaminant)." It shall also state "for respiratory protection in atmospheres containing not more than X percent by volume of (name of contaminant)."

c. Each canister shall have a label warning that gas masks should be used only in atmospheres with enough oxygen to support life (at least 16 percent by volume), since the cartridges are only intended to neutralize or remove contaminants from the air.

d. Each canister shall be painted a distinctive color or for a particular contaminant. For example, an organic vapor canister is signified by the color black; a canister for use in ammonia gas atmospheres (limited to 300 ppm) is green.

e. The use of one manufacturers respirator cartridge in conjunction with another manufacturers respirator is unacceptable. The problem with interchanging brand names is that an airtight seal cannot be guaranteed. In addition, the interchanging of respirator components voids any approval granted by NIOSH/MSHA.

10. Medical Requirements. It is important that no employee be assigned to tasks requiring the use of respirators if, based upon their most recent medical examination, the examining physician determines that the employee will be unable to function normally while wearing a respirator, or that the safety and health of the employee or other employees will be impaired by their use of a respirator. The focus of the medical examination should be on pulmonary and cardiovascular related problems. Workers who have indications of coronary artery disease, myocardial infarction, angina pectoris, or progressive or severe hypertension should only wear a continuous flow air line respirator unless approval from their physician is obtained. Those whose duty it is to respond to emergencies should not wear any type of respirator if they have a cardiovascular deficiency. Other physical conditions, such as diabetes or grand mal epilepsy, may limit wearing of respirators. With any individual medical problem, the final decision regarding respirator use is the responsibility of the examining physician.

SECTION 1
GUIDE FOR SELECTION OF RESPIRATORS

A-1. The FOA Safety and Occupational Health Office is responsible for advising supervisors on the type of respirator required. In selecting a respirator, Safety/Health and supervisory personnel should assemble the information needed by answering the following questions:

a. What is the measured or estimated contaminant concentration at the breathing zone of the worker?

b. What is the Permissible Exposure Limit (PEL) and/or Threshold Limit Value (TLV) of the contaminant? (Use more stringent of the two).

c. Is the workspace oxygen deficient (less than 19.5% oxygen)?

d. What is the lower explosive limit (LEL) of the contaminant?

e. Does an IDLH situation exist at contaminant concentration?

f. If gas or vapor --

(1) Is efficient sorbent available?

(2) Does contaminant have adequate warning properties?

g. Will eye irritation occur at contaminant concentration?

h. Will skin absorption pose a problem?

i. Are there other circumstances/conditions which should be considered?

A-2. Using the above information and Table A-1 and A-3, select the proper type of respirator and facepiece. Sections of these tables have been extracted from OSHA Instructions 2-20.20 Ch-4, 4 JUN 82, the original sources being "ANSI STANDARDS" and "Respirator Protection Factors" E. Hyatt, Los Alamos Scientific Laboratory Publication LA - 6084 - MS, Jan 76.

TABLE A-1

RESPIRATOR SELECTION GUIDE

HAZARD	TYPE RESPIRATOR
GASES OR VAPORS	
Oxygen Deficiency	Self-contained breathing apparatus, positive pressure mode. Combination air-line respirator with auxiliary positive pressure self-contained air supply.
Immediately dangerous to life or health (IDLH)	Self-contained breathing apparatus in positive pressure mode. Combination air-line respirator with auxiliary positive pressure self-contained air supply.
Not immediately dangerous to life health	Air-line respirator. Air-purifying, half-mask or full or facepiece respirator with chemical cartridges or canister.
PARTICULATES	
Immediately dangerous to life or health (IDLH)	Self-contained breathing apparatus in positive pressure mode. Combination air-line respirator with auxiliary positive pressure self-contained air supply.
Not immediately dangerous to life or health	Air-line respirator. Air-purifying, half-mask or full facepiece respirator with filters (pads or cartridges). Air-line abrasive-blasting helmet.
COMBINATION GASES, VAPORS AND PARTICULATES	
Immediately dangerous to life or health (IDLH)	Self-contained apparatus in positive pressure mode. Combination air-line respirator with auxiliary positive pressure self-contained air supply.

Not immediately dangerous to life health	Air-line respirator. Air-purifying, half-mask or full or facepieces respirator with chemical cartridges or canister and appropriate filters.

TABLE A-2

PROTECTION FACTORS FOR PARTICULATE FILTER RESPIRATORS

Concentration in multiples of the PEL or TLV	Facepiece Pressure	Permissible Respirators
5 X	-	Single use dust
10 X	-	Half-mask dust
	-	Half-or quarter mask, fume
	-	Half-or quarter mask, high efficiency
	-	Half-mask supplied air
50 X	-	Full facepiece, high-efficiency
	-	Full facepiece, supplied air
	-	Self-contained breathing apparatus (SCBA)
1,000 X	+	Full facepiece, SCBA
	+	Full facepiece supplied air and auxiliary self-contained air supply
Fire fighting or emergency entry into unknown concentrations	+	Full facepiece SCBA
Escape only 1/	+	Any SCBA
	+	Any self rescuer

1/ In an atmosphere which is immediately dangerous to life or health.

NOTES: 1. Half-mask and quarter-mask respirators should not be used. Particulate matter causes eye irritation at these concentrations.

2. Full facepiece supplied-air respirators should not be used in any atmosphere which is immediately dangerous to life or health unless it is equipped with an auxiliary air supply which can be operated in the positive pressure.

TABLE A-3

PROTECTION FACTORS FOR GAS
OR VAPOR RESPIRATORS

Concentrations in multiples of the PEL or TLV	Facepieces Pressure	Permissible Respirators
10 X	-	Half-mask chemical cartridge respirator with "Name" cartridges, or canister half mask, supplied-air
50 X	-	Full facepieces gas mask or chemical cartridge with "Name: cartridges or canister.
	-	Full facepieces SCBA Full facepieces supplied-air
1,000 X	+	Half-mask supplied-air
2,000 X	+	Supplied-air with full facepiece, hood, helmet or suit
10,000 X	+	Full facepiece, SCBA
	+	Full facepiece supplied air with auxiliary self-contained air supply
Fire fighting or emergency entry into unknown concentrations	+	Full facepiece SCBA
Escape only 1/	+	Any full facepiece SCBA
	+	Any self-rescuer

1/ In an atmosphere which is immediately dangerous to life or health.

NOTES: 1. The "Name" means approved chemical canisters or cartridges against a specific contaminant or a combination of contaminants such as organic vapor, acid gases, organic vapor plus particulates or acid gases plus organic vapor.

2. Quarter or half-mask respirators should not be used if eye irritation occurs at the use concentration.

3. Full facepieces supplied air respirators should not be used in any atmosphere which is immediately dangerous to life or health unless it is equipped with an auxiliary air tank which can be operated in the positive pressure mode.

4. Air purifying respirators cannot be used for contaminant having inadequate warning properties.

APPENDIX O
HEARING CONSERVATION

1. Purpose. The purpose of this appendix is to eliminate occupational noise-related hearing loss among Jacksonville District personnel.

2. Applicability. This appendix applies to all elements of the Jacksonville District. The provisions of this appendix do not apply to deaf personnel as defined in ANSI S3.20.

3. References.

a. EP 385-1-58, Medical Surveillance.

b. ER 385-1-89, Hearing Conservation.

c. 29 CFR 1910.95, OSHA, Occupational Noise Exposure.

d. 29 CFR 1926.52, OSHA, Occupational Noise Exposure.

e. MIL STD 1472C, Human Engineering.

f. MIL STD 1474B, Noise Limits.

g. TB MED 501, Hearing Conservation.

h. EM 385-1-1, Safety and Health Requirements Manual.

4. Background. Noise is unwanted sound and it is transmitted, primarily, to the ear through air. It may injure the hearing mechanism. Noise-induced hearing loss may be temporary or permanent, depending on the frequency and intensity of the noise and the duration of exposure. Temporary hearing loss or temporary threshold shift results from auditory fatigue induced by exposure to intensive sound, and there is a return of the individuals pre-exposure hearing level after a period of time away from intensive sound. Permanent hearing loss or permanent threshold shift results from damage to the end organ of the inner ear and it is not reversible by any known treatment.

5. Requirements.

a. Each supervisor is responsible to implement and be familiar with the criteria established in this appendix. They are responsible for identifying those areas where employees are exposed to high noise levels, posting of noise hazardous areas,

use of engineering controls, education on prevention of hearing loss, and use of personal protective equipment. Noise hazards will be included in the Job Hazard Analysis.

b. Supervisors shall notify the S&OH Office of suspected noise hazardous areas. The S&OH Office shall conduct noise surveys to determine the level of exposure. In areas where employees are subjected to noise levels of 85 dbA continuous or 140 dbA impulse regardless of duration, engineering and/or administrative controls (limiting the duration of exposure, etc.) will be implemented to reduce the noise hazard. In noise hazardous areas where engineering and/or administrative controls are not feasible, any employee exposed to 85 dbA or greater shall be provided hearing protection devices and will be entered in the District Medical Surveillance Program. Nobody should be exposed to impulse or impact noise above 140 dbA peak sound pressure level.

6. Responsibilities:

a. Supervisors shall:

(1) Request the S&OH Office to measure and analyze all areas and equipment suspected of being noise hazardous. An area where one has to shout to communicate is probably over 85 dbA. DD Form 2214 shall be completed for every noise survey.

(2) Post signs or sticker labels on equipment and/or areas where noise is a hazard.

(3) Enforce the use of hearing protective equipment.

(4) Include noise exposure in employees Job Hazard Analysis.

(5) Inform the Personnel Office of positions where noise is hazardous to employees.

(6) Ensure engineering controls are established to protect employees from noise hazards.

(7) Requisition hearing protection equipment with the lowest noise emission levels performance requirements for noise environment.

(8) Ensure air boat operators wear double protection, i.e., ear plugs and ear muffs.

(9) Ensure that only hearing protective devices meeting requirements established by ANSI S3.19, are issued to employees exposed to noise hazard areas.

(10) Ensure that the applicable job description contains the requirement employee must wear hearing protection in performance of the job.

(11) Use disciplinary actions when necessary to enforce the proper use of hearing protection.

(12) Ensure that employees receive orientation and ongoing training on hearing conservation during safety meetings.

(13) Ensure that employees exposed to a noise hazardous work environment are considered for inclusion in the Hearing Conservation Program.

b. Employees shall:

(1) Wear provided proper hearing protection when required.

(2) Report for Audiometric testing when required.

(3) Attend and participate in periodic safety and occupational health training.

c. Safety and Occupational Health Office shall:

(1) Use only calibrated equipment for measuring and analyzing noise.

(2) Notify supervisors of areas or equipment that produce hazardous noise.

(3) Maintain all noise survey records for 40 years.

(4) Make provisions to schedule personnel for audiometric testing and yearly follow-up hearing tests for all personnel included in the Hearing Conservation Program.

d. Occupational Health Unit shall:

(1) Ensure audiometric testing is conducted by a physician, audiologist, otolaryngologist, or by a certified

technician under the supervision of one of the listed professionals.

(2) Ensure that the audiometric testing is conducted in an environment which allows 0 dbA hearing levels at test frequencies of 500, 1000, 2000, 3000, 4000, and 6000 Hz. Testing shall also include puretone, air conductive hearing threshold levels in each ear with test frequencies of at least 500, 1000, 2000, 3000, 4000, and 6000 Hz.

(3) Notify employees of any validated standard threshold shift (STS) in hearing loss further retesting.

(4) Maintain a roster of all personnel included in the Hearing Conservation Program.

e. Human Resources shall ensure that each job description of positions requiring inclusion in the Hearing Conservation Program reflect that information.

d. Engineering Division shall include noise abatement and noise considerations in their design work.

APPENDIX P
CONTRACT DIVING OPERATIONS

1. General. The Contractor shall have and execute a Safe Diving Practices Manual and a Dive Operations Plan. The term "Contractor" includes sub-contractors at any tier, and includes all forms of contracting arrangements, including, but not limited to construction contract, supply contract, service contract, purchase order, delivery order under an Indefinite Delivery contract, etc.

2. References. All diving operations shall be performed and conducted in accordance with the requirements of this regulation and the following documents, latest edition at time of submittal of offer (where a difference in standards exists, the most stringent shall apply):

a. U.S. Army Corps of Engineers' Safety and Health Requirements Manual, EM 385-1-1.

b. U.S. Navy Diving Manual, Volumes I and/or II (NAVSEA, 0994-LP-001-9010 and NAVSEA 0994-LP-001-9020), as appropriate.

c. 29 CFR 1910, Subpart T, OSHA.

d. U.S. Army Corps of Engineers, South Atlantic Division regulation CESADR 385-1-1.

3. Administration. The following items shall be furnished by the contractor as a single submittal after award of the contract, preferably before the pre-construction conference. All items must be reviewed and accepted by the District Diving Coordinator (DDC) prior to the commencement of any diving operations. These items shall be a completely separate document from the Accident Prevention Plan required for any other work under the contract.

a. Safe Diving Practices Manual.

b. Dive Operations Plan (see EM 385-1-1, paragraph 30.A.13). This Plan shall contain information specific to the diving operation(s) to be performed under the contract. A generalized, philosophical discussion of diving, or an enumeration of diving-related theory will NOT be accepted.

c. Activity Hazard Analysis. This must address specific hazards anticipated for the particular diving operations to be performed under the contract, and must specifically address other

work of any kind being performed under the contract that could interface with or affect the diving operation, such as crane lifts, as well as methods or procedures for communications between the other work, crane operators, etc., and the divers. Applicable lock out, tag out or safe clearance procedures for any machinery that could affect the divers must also be included in the Analysis.

d. Medical certificate from a licensed physician who is qualified in barotrauma and hyperbaric medicine. The certificate shall indicate that the diver is physically qualified to perform diving work, and detailing any limitations the individual may have. The certificate shall be based upon a physical examination of the diver conducted by that physician within the 365 calendar days immediately prior to the date of any dive performed under the contract.

e. An up-to-date resume for each diver, describing diving training and experience for that individual.

f. Proof of CPR and first-aid training for each member of the dive team.

g. Air quality certificates or other documentation, demonstrating that the breathing air source for the divers has been tested at not more than 6-month intervals, and otherwise complies with the standards specified in paragraph 30.E.05.b, EM 385-1-1.

h. Certification or documentation that any SCUBA air cylinders to be used by the divers have been visually inspected at 12-month intervals and hydrostatically tested at 5-year (60-month) intervals as specified in paragraph 30.B.03.f(3), EM 385-1-1.

i. Identification of the oxygen resuscitation equipment to be available at the dive location during any diving operations.

4. Organization and Responsibilities.

a. The District Safety and Occupational Health Office is responsible for the oversight of the District Diving Policy. With respect to contract diving operations, that oversight includes, but is not limited to, the following:

(1) Review of contractor's Dive Plans and Diving logs as part of regular scheduled inspections.

(2) Review of Preventative Maintenance Program for all diving equipment utilized by contractor divers, including log of equipment inspection and maintenance, and record of air quality certification as part of regular scheduled inspections.

(3) Review of medical certificates for divers.

(4) Review of each contractor's dive plan, including recommendations of the DDC.

b. The DDC has the responsibility of organizing, integrating, monitoring, and administering the total diving program within the District. All matters concerning diving operations shall be referred to him/her. The DDC shall also:

(1) Review all dive plans.

(2) Maintain all records of District diving operations.

c. An alternate DDC shall perform the above duties when the DDC is not available.

d. Tender. Each tender shall perform pre-dive and post-dive inspections of all diving gear and support equipment, establish diving time schedules, serve as timekeeper when the dive team does not include one, and assist divers as needed.

e. Diver. Each Diver shall ensure that he/she has an adequate air supply, sufficient air reserve, and all required equipment in his/her possession during diving activities. Each diver is responsible for notifying the Diving Supervisor/Dive Master of any changes in his/her ability to dive safely. Each Diver shall maintain a Diving Log. (Sample form enclosed at Section 1 of this Appendix.)

5. Operations.

a. Equipment. Types of equipment as prescribed in the U.S. Navy Diving Manual are considered acceptable.

(1) All diving equipment, including diving craft, shall be inspected at least every 12 months and following any repairs, accidental damage, or long periods of disuse. These inspections will be documented in writing, and legible copies of the most recent inspection certificates/reports will be made available to the Government upon request.

b. Repetitive Dives. Special problems are associated with repetitive diving and the procedures and tables outlined in the U.S. Navy Diving Manual shall be closely followed when performing repetitive dives. The repetitive dive work sheet (Sample form enclosed at Section 2 of this Appendix) shall be used to record and control dives in this category.

c. Emergency Diving Requirements. When situations arise requiring an emergency dive, the DDC shall receive immediate telephone notification of the same, along with a verbal diving plan which will be confirmed in writing. An "emergency" will not be created or declared to circumvent the requirement to submit a Dive Plan for diving operations in support of scheduled work under the contract.

d. Alteration of Mission. If for any reason the dive mission as planned is altered, the DDC shall be contacted and the revised procedure established, reviewed and approved prior to the operation continuing.

e. Snorkeling and Breath-hold Diving. Snorkeling and breath-hold diving are considered to be diving activities conducted without an artificial source of breathing air. Therefore, all requirements of this regulation and the documents referenced in paragraph 2, above, shall be strictly adhered to, except those that relate to or specify breathing air sources and equipment. In lieu of buoyancy compensators, snorkeling vests shall be furnished for and worn by all employees performing snorkeling.

6. Inspection of Diving.

a. Diving Inspectors are normally not required for nonworking type dives. Nonworking type dives are defined as those which are performed in order to conduct an inspection, recover minor dropped items, and sample gathering. A/E contracts fall under this category. Conditions may require that inspections be performed in some cases, as on working dives, as determined by the DDC.

b. Full-time inspection of working dives is not required. A Diving Inspector will be present at the initial pre-dive conference and may spot check any working dive. Diving Inspectors shall be trained and designated as specified in EM 385-1-1.

c. Full-time inspection will be required in all dives in which it is felt a clear and present hazard exists. The decision for full-time inspection will be made by the Area Engineer/Staff Chief with the concurrence of the DDC.

d. If the situation arises where an activity does not have a Diving Inspector and one is needed, the DDC will assist in arranging for one from another activity.

7. Dive Teams. The minimum number of personnel required for all contract diving operations in the Jacksonville District is as follows:

a. SCUBA Diving - Untethered, working depth 0 to 60 feet.

Diving Supervisor/Dive Master*	1
Divers (In the water, in visual contact at all times.)	2
Standby Diver	1
Total team members	4

* The Diving Supervisor/Dive Master will have NO OTHER DUTIES, and WILL NOT SERVE AS THE STANDBY DIVER.

b. SCUBA Diving - Tethered with communications, working depth 0 to 100 feet.

Diving Supervisor/Dive Master*	1
Diver in water	1
Standby Diver (tethered with communications)	1
Tender**	2
Total team members	5

* The Diving Supervisor/Dive Master will have NO OTHER DUTIES, and WILL NOT SERVE AS TENDER FOR THE STANDBY DIVER.

** For each additional diver in the water, one Tender will be added to the team. The Tender for the Standby Diver will serve as Timekeeper for all Divers in the water.

c. Surface-supplied air - any working depth.

Diving Supervisor/Dive Master*	1
Diver in water	1
Standby Diver	1

Tender**	2
Timekeeper (For all dives to working depths in excess of 33 feet)	1
Total team members	5 or 6

* The Diving Supervisor/Dive Master will have NO OTHER DUTIES, and WILL NOT SERVE AS STANDBY DIVER, TIMEKEEPER, OR TENDER FOR THE STANDBY DIVER.

** For each additional diver in the water, one Tender will be added to the team. For dives to working depths of less than 33 feet, the Tender for the Standby Diver will serve as Timekeeper for all Divers in the water. For dives deeper than 33 feet and/or repetitive dives, the standby diver must not have dived within the past 12 hours.

d. Surface-supplied mixed-gas diving (HeO2). Will be in accordance with Table IV of Appendix N to EM 385-1-1.

8. Emergency Procedures.

a. The following are procedures to be followed in the event of a diving emergency. The entire team shall become familiar with these procedures.

(1) For diving operations along the coastal and gulf waters, the Intercoastal Waterway, and the Lake Okeechobee area, requests for emergency assistance may be made to the U.S. Coast Guard. The closest location should be utilized to save time. Marine radio channel 16, for emergencies, should be used in lieu of telephones calls. Any call placed to the U.S. Coast Guard should be directed to the Duty Officer.

(2) For all diving operations, the Diving Master/Supervisor is responsible for obtaining the nearest location and emergency numbers (ambulance, police, hospital, hyperbaric chamber, etc.) for the diving area, and including that information in the Dive Operations Plan.

b. Emergency air transport service will allow for seriously injured personnel to be transported to hospitals and/or hyperbaric chambers locations. As a minimum, the following should be made available at the time of the rescue effort:

(1) Name of person making request.

(2) Exact location of pick-up site.

(3) Number of injured persons with ages.

(4) Type of injuries.

(5) Time of injury.

(6) Condition of patient(s).

(7) Special equipment/medication/attention required to sustain life of patient(s).

(8) Pick-up site information.

(a) Marking of landing area (lights, flares, smoke, markers, etc.).

(b) Type of landing area (parking lot, grass field, ocean pickup, helipad, etc.).

(c) Obstructions (power lines, buildings, flag poles, etc.).

(d) Weather (estimated ceiling, and visibility, any precipitation).

(e) Winds (estimated direction and velocity).

(9) Proposed destination of patient(s).

(10) Number of persons to accompany patient(s).

APPENDIX Q
GOVERNMENT PERSONNEL DIVING OPERATIONS

1. Purpose. This appendix, in conjunction with ER 385-1-86, prescribes policy requirements, responsibilities, and procedures for all under-water diving operations performed by employees of the U.S Army Corps of Engineers (USACE). This Appendix is the "Safe Practices Manual" for Jacksonville District required by paragraph 7 of ER 385-1-86.

2. References.

a. ER 385-1-86.

b. NAVSEA, O994-LP-001-9010.

c. 29 CFR 1910, Subpart T, OSHA.

d. South Atlantic Division regulation DR 385-1-1.

3. Policy. It is the policy of USACE that all underwater activities shall be conducted in a manner which will provide maximum efficiency and minimize the potential for personal injury, loss of life, occupational illness, and/or property damage. Diving will not be utilized if the objective(s) can be more safely accomplished by other means, e.g., using remote controlled television systems in lieu of divers.

4. Organization and Responsibilities.

a. The Safety and Occupational Health Office is responsible for oversight of the District Diving Policy. With respect to diving operations performed by USACE personnel, that oversight includes, but is not limited to, the following:

(1) Review of Dive Plans and Diving Logs as part of regularly scheduled inspections.

(2) Review of Preventative Maintenance Program for all diving equipment, including log of equipment inspection and record of air quality certification as part of regularly scheduled inspections.

(3) Review of medical records for each diver by an Occupational Health Nurse on a semi-annual basis.

(4) Semiannual review of diving records as kept by the District Diving Coordinator (DDC); to include:

(a) Dive Plans.

(b) Dive Logs; including repetitive dive work sheets.

(5) Providing a Safety and Occupational Health Office Dive Safety Representative, as described in Appendix A to ER 385-1-86.

b. The District Diving Coordinator (DDC) has the responsibility of organizing, integrating, monitoring, and administrating the total diving program within the District. All matters concerning diving operations shall be referred to the DDC. The DDC shall also:

(1) Review all dive plans.

(2) Maintain all records of District diving operations.

(3) Maintain updated records of training and medical certifications for all divers. All medical records will be kept in the Health Unit files.

(4) Appoint a Diving Equipment Monitor (DEM) for each office with diving operations.

c. An Alternate DDC shall perform the above duties when the DDC is not available.

d. Diving Equipment Monitor (DEM). The DDC shall designate, in writing, a qualified individual to serve as DEM for each District element authorized to maintain dive team(s). The DEM shall ensure that the organization's diving equipment (including each source of compressed air) is inspected at the required frequency and is in operational condition. The DEM shall have any equipment that is not in proper condition either repaired or removed from service. The DEM shall maintain a log of each equipment inspection, malfunction, modification, repair, test or calibration. Records shall include the date and nature of work performed and the name and organization of the person performing the work.

e. Tender. Each tender shall perform pre-dive and post-dive inspections of all diving gear and support equipment, establish diving time schedules, serve as timekeeper when the dive team does not include one, and assist divers as needed.

f. Diving Supervisor. The Diving Supervisor is a Corps employee who supervises Corps employee divers during a diving operation. He/she has overall responsibility for the conduct and safety of each diving operation. He/she shall ensure that all equipment required for the job is available at the work site, that the diving plan has been submitted and approved, that each dive is conducted according to the plan, and that each diver is visually inspected for signs of sickness or injury prior to diving and immediately after surfacing. He/she shall conduct a pre-dive briefing and shall ensure that each member of the dive team is familiar with the briefing material. The Diving Supervisor is qualified only by successful completion of HQUSACE-approved training. The Diving Supervisor will have no other assigned duties during a dive, and is the individual who prepares written diving plans for USACE employee dives.

g. Diver (General). Each Diver shall ensure that he/she has an adequate normal air supply, sufficient air reserve, and all required equipment in his/her possession during diving activities. Each diver is responsible for notifying the Diving Supervisor of any changes in his/her ability to dive safely. All USACE employee divers will be on record with the DDC. This status may be obtained in the following ways:

(1) Diver-in-Training. This certification will be authorized upon successful completion of a basic SCUBA diving course recognized by the National SCUBA Training Council. The Deputy Commander must approve this certification in writing, according to, and with the restrictions of, 6.a. below. Divers-in-Training will not be counted as a "Diver" for purposes of the minimum number of Divers required for a dive team required by Appendix E to ER 385-1-86.

(2) Corps Diver. All divers designated as members of a dive team pursuant to Appendix E to ER 385-1-86 will hold this designation. A Corps Diver is certified with the restrictions of 6.a.(2) below.

5. Administration.

a. Medical. A physical examination performed by a licensed physician will be required of all divers. A statement from the physician indicating that the diver is physically qualified to perform diving work and detailing any limitations the individual may have, will be required prior to diving. This statement shall be based upon a physical examination conducted by that physician within the 365 calendar days immediately prior to the date of the

dive. Each physical examination shall address all items specified in Appendix C to ER 385-1-86.

b. Record Keeping. Each Diver shall maintain a log for each dive conducted. The log shall be kept by that diver for at least one year and a copy shall be forwarded to the DDC immediately upon completion of each diving assignment. The diving log format is shown in Section 1. (Also see paragraph 7.e. of ER 385-1-86.) Each diver will provide the DDC with copies of all current certifications for diving training (PADI, NAUI, HQUSACE-approved, etc.) and first aid and CPR training, as soon as each is obtained. (Also see paragraph 7.f. of ER 385-1-86, for records to be created and maintained in the event of symptoms of decompression sickness or pulmonary barotrauma.)

c. The DDC will review the individual's medical and diving qualifications, first-aid and CPR training certifications, etc., and if they meet the required standards, the DDC will issue to the individual a Letter of Authorization (LOA) to perform underwater diving operations. This LOA will establish the diver's status, limits, and special conditions to be observed by the diver. Each LOA will be valid for a period not exceeding twelve months from the date of the diver's latest medical examination, first-aid or CPR training, etc. If an individual fails to meet the required standards, he/she will be notified of the basis for failure by the DDC.

d. Renewal of authorization. The renewal of a previously issued authorization to dive shall follow the procedures for authorizing new divers.

e. Termination of authorization to dive. Requests for removal from diving status shall be made in writing to the DDC. The DDC may revoke, suspend, or restrict an individual's diving authorization when, in the DDC's opinion, the individual's ability to dive safely is impaired. When an individual is removed from diving status for any reason, the DDC shall notify the individual through his/her supervisor in writing.

6. Training.

a. Initial Training. USACE employees may be placed in a diving status upon successful completion of a basic SCUBA diver course recognized by the National SCUBA Training Council. Employees can only obtain this status by forwarding a written request to the DDC, detailing the necessity of this status, approved by the Staff Chief/Area Engineer; and furnishing copies

of proof of diving, first-aid and CPR training; a brief resume of diving experience; medical certification; and an SF 52 to add "Diver" to the employee's job title. The SF 52 will be prepared for approval by the Deputy Commander. The DDC will obtain approval from the Deputy Commander to authorize this status. If this status is authorized, the DDC will notify the employee in writing by issuing a Letter of Authorization, pursuant to paragraph 5.c. of this Appendix.

(1) Diver-in-Training. Divers who possess a Basic SCUBA Diver certification and are restricted as stated in paragraph 6.a., above. Employees may remain in the Diver-in-Training classification for a maximum of 12 months, by which time the HQUSACE-approved "Diver Safety" training course must be successfully completed. All divers in this category are limited to SCUBA equipment and to a maximum depth of 33 feet. All dives performed by a diver with only basic SCUBA certification MUST be accomplished under the direct, in-water supervision of a diver with the Corps Diver classification.

(2) Corps Diver. Divers who have successfully completed the HQUSACE-approved diver training course may be classified as a Corps Diver. Divers assigned this category may dive with SCUBA or surface-supplied air equipment to a maximum depth of 100 feet, provided no decompression is required. Divers must complete 12 working/training dives per year to maintain this classification. Divers not performing 12 annual dives will have their letter of authorization revoked and will revert to Diver-in-Training classification for a period not to exceed one year, until the required 12 dives are performed under the direct in-water supervision of a Corps diver. If 12 dives are not performed during the one year period, the diver will be dropped from the District diving program.

b. Refresher Training. HQUSACE-approved refresher training is required at intervals not to exceed 4 years to retain certification as a Corps Diver, Diving Supervisor, Safety and Occupational Health Office Dive Representative, or Diving Coordinator.

c. First Aid Training. Each dive team member must hold a current certificate in first aid and CPR from the American Red Cross, or equivalent, to include the use of oxygen resuscitation equipment.

7. Operations.

a. U.S. Army (military) personnel from Engineer Detachments (Diving) can be made available to accomplish diving requirements. District elements having requirements for diving operations will consider the use of this resource, and should contact the DDC for further information. These detachments operate under their own regulatory guidance, thus relieving the District of preparing and reviewing dive plans.

b. Equipment. Types of equipment as prescribed in the U.S. Navy Diving Manual are considered acceptable. Any deviations will be with the knowledge and written approval of the DDC.

(1) All requisitions for acquisition, repair, etc., of diving equipment shall be routed through the DEM and the DDC, enroute to CESAJ-CT. Only approved equipment will be purchased or utilized by USACE employee divers; additionally, equipment modifications are not permitted at any time regardless of how logical it may appear, unless authorized in writing by the DDC.

(2) All diving equipment, including diving craft, shall be inspected at least every 12 months and following any repairs, accidental damage, or long periods of disuse.

(3) Compressed air cylinders shall be visually inspected at least every twelve months and hydrostatically tested every 5 years.

(4) Umbilicals and tethering lines shall be marked in 10 foot increments beginning at the diver's end.

(5) When SCUBA diving, a buoyancy compensator is mandatory and shall be capable of maintaining the diver in a face-up position at the surface.

(6) A cylinder pressure gauge capable of being monitored by the diver during the dive shall be worn by each SCUBA diver.

(7) A timekeeping device shall be available at each dive location.

(8) A standard diving flag shall be displayed during all dives.

c. Air Testing and Certification. Breathing air shall be tested in accordance with references 2.b. and 2.c., at intervals not to exceed 183 consecutive calendar days. Copies of

certificates documenting these tests shall be obtained from the vendor(s) whenever SCUBA tanks are filled, and forwarded to the DDC with the diving logs. A single copy of a certificate for repetitive tank fillings by the same vendor may be obtained at the 183-day intervals. Should it be impracticable to obtain a copy of the test results or certificate from a vendor, the format shown in Section 2 of this Appendix shall be prepared locally and signed by the vendor and an appropriate Corps employee attesting to the existence of the certificate

d. SCUBA Diving Operations. All SCUBA diving operations in the Jacksonville District will be accomplished in strict accordance with paragraph 9. of ER 385-1-86; except:

(1) The Diving Supervisor will NOT serve in any other capacity during the diving operation. That is, the Diving Supervisor will NOT serve (or be designated) as Tender, Stand-by Diver, Tender for Stand-by Diver, Timekeeper, etc.

(2) When line-tending is required, one Tender will be assigned to the dive team for EACH Diver in the water, AND for EACH Stand-by Diver.

(3) For dives to depths in excess of 60 feet (maximum depth of dive), an additional member of the dive team, to serve as Timekeeper, will be provided.

e. Repetitive Dives. Special problems are associated with repetitive diving and the procedures and tables outlined in the U.S. Navy Diving Manual shall be closely followed when performing repetitive dives. The repetitive dive work sheet (Section 3) shall be used to record and control dives in this category.

8. Diving Plans.

a. All diving operations within Jacksonville District are required to have a Diving Plan and an Activity Hazard Analysis. (See Sections 4 and 5 of this Appendix for an outline of a Diving Plan and examples of items to be included in an Activity Hazard Analysis.) The Diving Plan and Activity Hazard Analysis must be approved by the DDC prior to the commencement of any diving operations.

b. The responsible Diving Supervisor shall write and develop the operational dive plan and Activity Hazard Analysis.

c. When situations arise requiring an emergency dive, the DDC (or, in his absence, the Alternate DDC) shall receive immediate notification by telephone, to include a verbal diving plan which will be confirmed in writing.

9. Pre-Dive Conference.

a. Prior to any dive, a pre-dive conference shall be held at the scene of the dive with all members of the dive team.

b. Prior to any diving mission, the entire dive team will be briefed in detail (as a minimum) on the following:

(1) Description of mission and location.

(a) Drawings and/or photographs pertinent to the mission.

(b) Equipment or materials to be inspected, installed, removed, repaired, etc., as part of the mission.

(c) When possible, incorporate at least one member into the dive team who previously participated in the exact or a similar mission.

(2) Description of diving apparatus/equipment and craft to be used.

(3) Maximum working depths with estimated bottom times.

(4) Names and duties of personnel on the dive team.

(5) Discussion of Activity Hazard Analysis.

(6) Emergency procedures.

c. Alteration of Mission. If for any reason the dive mission as planned is altered, the DDC shall be contacted and the revised procedure established and reviewed prior to the operation continuing.

10. Snorkeling and Breath-hold Diving. Snorkeling and breath-hold diving are considered to be diving activities conducted without an artificial source of breathing air. Therefore, all requirements of this regulation and the references in paragraph 2, above, shall be strictly adhered to, except those that relate to or specify breathing air sources and equipment. In lieu of

buoyancy compensators, snorkeling vests shall be worn by all employees performing snorkeling and/or breath-hold diving.

11. Dive Teams. The number and types of personnel required to comprise dive teams shall be in accordance with Appendix E to ER 385-1-86, and paragraph 7.c. above. Deviations from these minimum manning levels may be authorized only by the DDC. It is emphasized that these are minimum diving levels - actual personnel deployment will be at a sufficient level to assure a safe, effective and efficient diving operation.

12. Emergency Procedures.

a. The following are procedures to be followed in the event of a diving emergency. The entire team shall become familiar with these procedures.

(1) For diving operations along the coastal and gulf waters, the Intercoastal Waterway, and the Lake Okeechobee area, requests for emergency assistance should be made through the U.S. Coast Guard. The U.S. Coast Guard Base locations can be found in the attached list (Section 6). The closest location should be utilized to save time. Marine radio channel 16, for emergencies, should be used in lieu of telephones calls. Any call placed to the U.S. Coast Guard should be directed to the Duty Officer.

(2) If emergency air transportation service is needed, this service may be requested through the U.S. Coast Guard.

(3) A listing of Hyperbaric chambers is attached with emergency numbers (Section 7). This information should be verified by the Diving Supervisor prior to any dive.

(4) For diving emergencies around inland Florida, the Diving Supervisor is responsible for obtaining the nearest emergency numbers (ambulance, police, hospital) for the diving area prior to diving, and including that information in the Diving Plan.

b. Emergency air transport service may be requested through the local police. This service will allow for seriously injured personnel to be transported to hospitals and/or hyperbaric chambers locations. Hospitals in all major cities in Florida have helipads for emergency landings. As a minimum, the following should be made available for rescue:

(1) Name of person making request.

(2) Exact location of pick-up site.

(3) Number of injured persons, with ages.

(4) Type of injuries.

(5) Time of injury.

(6) Condition of patient(s).

(7) Special equipment/medication/attention required to sustain life of patient(s).

(8) Pick-up site information.

(a) Marking of landing area (lights, flares, smoke, markers, etc.).

(b) Type of landing area (parking lot, grass field, ocean pickup, helipad, etc.).

(c) Obstructions (power lines, buildings, flag poles, etc.).

(d) Weather (estimated ceiling, and visibility, any precipitation).

(e) Winds (estimated direction and velocity).

(9) Proposed destination of patient.

(10) Number of persons to accompany patient(s).

FOR ILLUSTRATION PURPOSES ONLY
(Local reproduction authorized - blank masters available from local FMO)

DIVING LOG

NAME (LAST, FIRST, MIDDLE I.)

DATE OF LAST PHYSICAL:	TENDER:	DISTRICT & PROJECT:

1. DIVE

DATE:	DEPTH OF DIVE:	REPETITIVE DIVE:	BOTTOM TIME
	FT.	☐ YES ☐ NO	

2. DIVING CONDITIONS

WATER DEPTH:	WATER TEMP.:	CURRENT:	TYPE BOTTOM:	BOTTOM VISIBILITY:
FT.	°F.	KTS		FT.

3. TYPE WORK	4. EQUIPMENT
(NONE, MILD, MODERATE, HEAVY)	☐ DEEP SEA ☐ SCUBA (OPEN) ☐ HEL-OXYGEN ☐ MASK ☐ SCUBA (CLOSED) ☐ OTHER: _____

5. BREATHING MEDIUM

AIR	HELIUM	OXYGEN	NITROGEN
	%	%	%

6. SOURCE OF BREATHING MEDIUM

☐ AIR BANKS ☐ HEO BANKS ☐ COMP.

7. REPETITIVE NO-DECOMP. DIVES

	1	2	3	4
TIME OUT				
TIME IN				
TIME (MIN.)				
DISTANCE (YARDS)				
AIR OUT (PSI)				
AIR IN (PSI)				
AIR USED (CU FEET)				
MAX. DEPTH (FEET)				
☐ SUIT USED	BOT. VOL. (CU. FT.)	TOT. TIME (MIN.)	TOT. DIST. (YDS.)	

8. DECOMP. TABLE

STD.	SURFACE		HEO.	SCHEDULE	
	AIR	OXYGEN		FT./PP	MIN.

LEFT SURF.	REACH'D BOT.	LEFT BOT.	SURF'D.	ASC. TO 1ST STOP (FT/MIN)

9. DECOMPRESSION STOPS
(RECORD ADDITIONAL STOPS IN 11)

IF SURF. DECOMP. USED, TIME FROM LAST WATER TO FIRST CHAMBER STOP. _____ MIN.

DEPTH	WATER		CHAMBER	
	MIN.	BR. MED.	MIN.	BR. MED.
50				
40				
30				
20				
10				

10. TOTAL TIME OF DIVE(S)

THIS/THESE	CUMULATIVE
MIN.	HRS. MIN.

11. WORK SCHEDULES AND ACCOMPLISHED:

12. REMARKS:

_____ DIVING SUPERVISOR

_____ DIVING INSPECTOR

ENG FORM 1 JUN 77 4615-R (ER 385-1-86)

SECTION 2
CERTIFICATION FOR AIR TESTING

This certifies that the air compressor and distribution system used to fill SCUBA tanks at the following dive shop has been tested for air purity within the past six months.

Dive Shop: _____

Address: _____

_____

Date of last test: _____

Date: _____

Dive Shop Representative: _____

Corps Diver: _____

This statement is to be used when air is purchased in the field from a dive shop and a copy of the air certificate from a testing facility cannot be furnished by the vendor.

SECTION 3

FOR ILLUSTRATION PURPOSES ONLY
(Local reproduction authorized - blank masters available from local FMO)

REPETITIVE DIVE WORKSHEET		
1. PREVIOUS DIVE		
_____ minutes _____ feet	see table 1-10 or 1-11 for repetitive group designation	Group _____
2. SURFACE INTERVAL		
_____ hours _____ minutes on surface Group _____ (from 1.)	see table 1-12 for new group	Group_____
3. RESIDUAL NITROGEN TIME		
_____feet (depth of repetitive dive) Group _____(from 2.)	see table 1-13	_____ minutes
4. EQUIVALENT SINGLE DIVE TIME		
_____ minutes (residual nitrogen time from 3.) (add) _____ minutes (actual bottom time of repetitive dive) (sum) _____ minutes		
5. DECOMPRESSION FOR REPETITIVE DIVE		
_____ minutes (equivalent single dive time from 4.) _____ feet (depth of repetitive dive)	see table 1-10 or 1-11	
☐ No decompression required or Decompression stops: _____ feet _____ minutes _____ feet _____ minutes _____ feet _____ minutes _____ feet _____ minutes		

NOTE: Tables referred to above are US Navy Standard Decompression Tables

ENG FORM 1 JUN 77 4616-R (ER 385-1-86)

SECTION 4
SAMPLE DIVING PLAN

1. Operations.

    a. Date and location of proposed dive.

    b. Purpose of dive.

    c. Itemize elements of underwater work.

2. Conditions in Diving Area.

    a. Water depth (maximum diving depth).

    b. Maximum bottom time(s) for the dive(s).

    c. Visibility (average anticipated).

    d. Water temperature range.

    e. Currents (maximum to be expected).

    f. Obstructions.

    g. Other hazardous conditions known or suspected. (To include hazardous marine organisms.)

3. Diving Techniques.

    a. Type of dive (category).

    b. Special procedures (safety line, etc.).

4. Equipment. (As specified in paragraph 7.b of Appendix Q to CESAJR 385-1-1 and special equipment. This will serve as the on-site checklist.)

    a. Wet suit or other protective clothing, if used.

    b. Diving platform.

    c. Air supply. (To include copies of air test certificates.)

d. First aid kit. (To include oxygen resuscitation equipment.)

e. Other required equipment. (Stokes litter, backboard with flotation collar and lifting sling, diving flag, communications equipment, etc.)

5. Personnel.

a. Senior diver and qualification rating.

b. Tender-timekeeper.

c. Other personnel and certification.

d. Names and duties of all dive team members, including the Diving Supervisor.

6. Pre-Dive Conference.

a. All divers will be given an operation briefing by the Diving Supervisor prior to start of operations and entering the water.

b. Pre-dive check will be completed for each diver by the other Divers and the Diving Supervisor.

c. Discussion of the Activity Hazard Analysis for the dive.

d. Emergency procedures (specify assigned responsibilities for each member of the dive team).

7. Emergency Management Plan.

a. First aid qualified personnel at the dive location.

b. Name, location, etc., of the nearest medical facility, hospital, etc., including telephone number, estimated mileage, and evacuation route from the dive location.

c. Nearest recompression facility.

d. Nearest Coast Guard Station and telephone number for MEDIVAC.

8. An Activity Hazard Analysis, to specifically include lock out/tag out procedures, safe clearance procedures, communication with adjacent work, etc. (See Section 3 of this Appendix.)

9. All Diving Plans will include the following statements:

a. If for any reason the Diving Plan, as accepted, is altered in mission, depth, personnel, or equipment, the DDC shall be contacted in order that he may review any revision prior to actual operation.

b. All diving activities will be accomplished in accordance with Regulation CESAJR 385-1-1, Appendix Q, and ER 385-1-86.

SUBMITTED BY: _____

DATE: _____

RECOMMENDED FOR ACCEPTANCE: (Staff Chief or Area Engineer)

DATE: _____

APPROVED BY: (District Diving Coordinator, or Alternate)

DATE: _____

SECTION 5
ACTIVITY HAZARD ANALYSIS

1. Under the provisions of District Regulation CESAJR 385-1-1, Appendix Q, the following analysis of hazards that divers and diver support teams encounter is listed. Prior to each diving mission, this analysis will be reviewed by the Diving Supervisor in charge of the mission and applicable phases discussed with the dive team. Any hazardous conditions relative to an operation and not covered by this analysis will be forwarded to the DDC prior to beginning the mission.

2. The Analysis:

POTENTIAL HAZARDS	MEANS OF PREVENTION	ACTION IN CASE
Drowning	Adequate training, periodic drills in emergency procedures, utilize proper equipment and assure that it is in good condition. SCUBA divers wear buoyancy compensators, competent tenders, standby diver, appropriate craft, stages and access. Support personnel wear safety vest when applicable.	Administer CPR and get medical help immediately.
Air Embolism	Good physical condition with no lung disorder. Do not dive when experiencing pain in chest or colds. Proper training in the physics and physiology involved in diving, familiarity with equipment, breath normal when diving. Emphasis shall always be stressed on the possibility of accidentally inflating buoyany compensators.	Recompression in recompression chamber by trained personnel.
Decompression Sickness	Adhere to proper decompression tables, adequate sleep and rest, no alcohol (after-effects). Good physical condition. Proper equipment for heavy-cold work.	Restore breathing when necessary, give oxygen to patient, stop bleeding when present.

POTENTIAL HAZARDS	MEANS OF PREVENTION	ACTION IN CASE
Hypoxia	Proper testing of air. Do not use air that has been stored in cylinders for long periods of time.	Breathe fresh air and/or oxygen immediately.
Carbon Dioxide Excess	Assure adequate air supply. Do not breathe excessively.	Diver should surface or be brought up Immediately and provided with fresh air
Carbon Monoxide Excess	Assure proper maintenance and/or operation of air supply.	Same as CO2 excess.
Strangulation	Do not dive with obstructive objects in mouth, such as dentures, gum, or tobacco.	Surface the diver and relieve the cause. Remove obstruction with fingers when possible. Encourage coughing, pound on back, and/or hold inverted.
Blowup	When using deep-sea gear, assure proper adjustment of air-control and exhaust valves. Wear all gear appropriately.	Observe diver closely, recompression may be necessary.
Squeeze	Be knowledgeable of the many types of squeeze, sinus, lung, body mask, suit, etc., and always assure that equalization is possible.	Various treatments depending on type of squeeze. Refer to U.S.

POTENTIAL HAZARDS	MEANS OF PREVENTION	ACTION IN CASE
		Navy Diving Manual.
Fouling or Entanglement	Study dive area and anticipate obstruction, such as lines, cables snags, etc., as much as possible. Diver should always remember which side of an obstruction he passes and return the same way.	Standby or buddy diver assist. Ditch SCUBA equipment when necessary. Give very careful attention to time and depths while diver is fouled, to determine need for re-compression.
Mechanical	Secure topside objects that may accidentally fall on diver. Diver shall stay in direct communication with operator of hoisting equipment used in connection with diver. Handle tools and equipment carefully, and assure that Safe Clearance Procedures, Lock Out/Tag Out Procedures, etc., are established in writing for the specific application.	Administer first aid or treatment as required.
Burns	When welding and/or cutting under water, assure complete protective dress. All suit components shall join in such a manner to prevent the trapping of slag or molten metal.	Procedures are the same as for non-diving burns.
Overexertion or Exhaustion	The diver should know his own limits and stay within them. Stop and rest before becoming exhausted. Maintain and use	Provide help in getting diver from water and

POTENTIAL HAZARDS	MEANS OF PREVENTION	ACTION IN CASE
	proper equipment.	provide rest and warmth.
Electrocution	When welding or cutting, diver should never be between ground and arc. Assure that underwater electrical lighting is properly insulated. Assure that applicable Safe Clearance Procedures, Lock Out/Tag Out Procedures, etc., are established in writing for the specific application.	Give artificial respiration and medical assistance at once.
Hypothermia	Dress appropriately for underwater temperature. Ascend at the first sign of discomfort.	Keep diver in warm area and feed warm liquids until body temperature becomes normal. Medical assistance may be necessary.
Currents	Check for leakage prior to diving above or below gates, bulkheads, valves, etc., and be assured that safe clearance procedures are in effect. Tether all divers.	Reduce static head differential, if possible. Close all gates, valves, etc. Begin rescue operations.
Marine Life (Sharks, jellyfish, alligators, etc.)	Examine diving area prior to diving.	Exit water. Call Game & Fish Commission (alligators). Have sting neutralizing solution available (for jellyfish).

POTENTIAL HAZARDS	MEANS OF PREVENTION	ACTION IN CASE
Adjacent Work	Establish communications between ongoing adjacent work and the dive team. Stop adjacent work if at all possible for the duration of the diving operation. Assure that communication procedures are established in writing for the specific application.	Administer first aid or treatment as required.

SECTION 6
U.S. COAST GUARD BASES IN FLORIDA
(as of 20 August 1993)

JACKSONVILLE (Mayport) 904-247-7311 (Emergency Operations Center

The U.S. Coast Guard at Mayport extends from St. Simons Island, Georgia, to Melbourne, Florida.

MIAMI BEACH 305-535-4300 (Switchboard);
Ext. 4313, 4314, 4315, or 4316 (Operations-Duty Officer)

The U.S. Coast Guard at Miami Beach extends from Key Largo, Florida, to Melbourne, Florida.

KEY WEST 305-292-8727 (Operations-Duty Officer)

The U.S. Coast Guard at Key West covers the entire Florida Keys and along the Everglades National Park to Everglades City.

ST. PETERSBURG 813-896-6187 (Operations-Duty Officer)

The U.S. Coast Guard at St. Petersburg covers the area from Apalachicola, Florida, to Everglades City, Florida.

U.S. COAST GUARD COMMUNICATIONS CENTERS

These are local city numbers ("tie lines") to call the bases for emergencies.

Fort Lauderdale.....305-927-1611
Fort Myers Beach.....941-463-5754 or 1-800-528-6967
Fort Pierce.....407-464-6100
Ponce de Leon Inlet.....904-428-9084
Port Canaveral.....407-853-7601
St. Simons Island, GA.....912-638-3310
Yankeetown.....904-447-6900 or 1-800-874-4604
Clearwater (Sand Key).....813-596-8666 or 1-800-322-1579

The U.S. Coast Guard also monitors Emergency Marine Radio Channel 16 from the above list of cities.

U.S. COAST GUARD BASES IN PUERTO RICO AND THE U.S. VIRGIN ISLAND
(as of 3 November 1997)

San Juan.....809-729-7778 or 729-6770
St. Croix.....809-772-5557
St. Thomas.....809-776-3497
Borinquen.....809-882-3501

NOTE: These numbers are subject to change at anytime. Verification must be made when developing Dive Plans.

SECTION 7
HYPERBARIC (DECOMPRESSION) CHAMBER LOCATIONS IN FLORIDA AND PUERTO RICO
(as of 3 November 1997)

IN THE EVENT OF ANY DIVING EMERGENCY - IT IS RECOMMENDED THAT IMMEDIATE CONTACT BE MADE WITH THE DIVERS ALERT NETWORK (WHICH IS NATIONWIDE) AND HAS A 24 HOUR A DAY EMERGENCY NUMBER AT DUKE UNIVERSITY. 919-684-8111/2948

FLORIDA

GAINESVILLE

Shands Teaching Hospital
University of Florida
College of Medicine
Gainesville, Florida

Contact: Dr. Andrea Gabrelli
Department of Anesthesiology
Telephone: 352-395-0426 (24 hour answering service)
352-395-0300 (Emergency) (Flight Program)

JACKSONVILLE

Stroud Diving
5030 Old Lings Road
Jacksonville, Florida 32254

Telephone: 904-355-1777 (0800-1700, Monday thru Friday)
904-260-3887 (all other times)

Baptist Medical Center
800 Prudential Drive
Jacksonville, Florida 32207

Telephone: 904-202-1151 (0600-1600, Monday thru Friday)
904-202-2136 (all other times) - Emergency Room

HYPERBARIC (DECOMPRESSION) CHAMBER LOCATIONS IN FLORIDA AND PUERTO RICO
(as of 3 November 1997)

KEY WEST

Special Forces Divers Training Facility
U.S. Naval Station
Key West, Florida

Contact: Commanding Officer
Telephone: 305-293-4159 (24 hours per day)

MIAMI

Mr. Mark Kaiser
Mercy Hospital
3663 S. Miami Avenue
Miami, FL 33133

For access call Dade County Fire Rescue, Telephone
1-800-662-3637 (Outside Dade County), 911 (Dade County)

PANAMA CITY

U.S. Navy Experimental Diving Unit
Panama City, Florida

Telephone: 850-230-3100 24 Hours per day

PENSACOLA

Naval Aerospace Medical Institute
Physiological Training Division
Pensacola, Florida

Telephone:	850-452-3409 0715-1600 hours Monday thru Friday	850-452-2252 After 1600 hours Weekdays and Holidays

Dive Chamber: 850-452-3409

HYPERBARIC (DECOMPRESSION) CHAMBER LOCATIONS IN FLORIDA AND PUERTO RICO
(as of 3 November 1997)

Puerto Rico

CEIBA
Roosevelt Roads Naval Station
Ceiba, Puerto Rico

Telephone: Regular duty hours: 0630-1700 hours
787-865-4520
787-865-4584

After duty hours:
787-865-4005

TAMPA

St. Joseph's Hospital
3001 Martin Luther King Blvd.
Tampa, FL 33607

Telephone: 1-800-275-3483

NOTE: These numbers are subject to change at anytime. Verification must be made when developing plans.