

APPENDIX O
RESPIRATORY PROTECTION PROGRAM

1. Purpose. This Appendix prescribes requirements and procedures for the selection, use, care and maintenance of respirators.

2. Applicability. This Appendix applies to all elements of the Wilmington District. Contractors shall submit a Standard Operating Procedure (SOP) for the proper use and handling of respirators (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 11-34, The Army Respiratory Protection Program.
- c. AR 40-5, Health and Environment.
- d. EM 385-1-1, General Safety and Occupational Health Requirements Manual.
- e. ER 385-1-90, Respiratory Protection Program.
- f. CESAD Supplement 1, ER 385-1-90, Sep 85.
- g. TB MED 502, Respiratory Protection Program.
- h. ANSI Z88.2 Practice for Respiratory Protection.

4. Background. When working with toxic materials, it has long been recognized that the respiratory tract is the most important route in which toxic substances enter the body. Inhaling toxic substances causes most industrial poisonings. The primary effort to control such hazards should be 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 employee 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

limitations associated with the various types of respirators.

5. Responsibilities. Overall implementation of the respiratory protection program is the responsibility of the Commander, Wilmington District.

a. Management at each Area, Resident, and Project office shall:

(1) Designate a Respiratory Protection Program Coordinator on the form contained in Annex I and provide a copy to the SOHO.

(2) Become familiar with the respiratory protection program as outlined in this Appendix. A copy of the program shall be maintained in the local office.

(3) Request assistance from the SOHO in conducting atmospheric testing of areas to determine if employees are exposed to contaminant levels in excess of the threshold limit values (TLV) and permissible exposure limits (PEL).

(4) Train a minimum of two employees on fit testing procedures.

(5) **Enforce the use of respirators by employees. Written documentation of employee's failure to wear respirators shall be cause for disciplinary action and shall be forwarded to the SOHO for inclusion in the employee's medical records.**

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

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

b. Managers and supervisors of all affected District HQ employees shall:

(1) Designate a Respiratory Protection Program Coordinator on the form contained in Annex I and furnish a copy to the SOHO.

(2) Ensure that all affected employees are trained in the proper use of respirators.

(3) Ensure that all affected employees are fit tested.

(3) Ensure that all affected employees are medically fit to wear a respirator.

c. All affected 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 Safety Office shall:

(1) Ensure that supervisors are notified of employee's periodic medical examination.

(2) Ensure that proper medical examination requirements are followed.

(3) Ensure that all respirators are approved by NIOSH and MSHA.

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

e. Each Program Coordinator will review all operations and areas designated for respirator use. The form shown on Annex II will be completed and forwarded to the SOHO. The objective is to ensure that all means of exposure control have been considered, that potential contaminants are properly identified, and that an appropriate respirator is available for the intended use.

6. Program Requirements.

a. Respirators and canisters shall be selected according the hazards the worker is exposed. **Project personnel must know which type of respirator and canister to use in each particular situation.** For guidance, refer to EM 385-1-1, Appendix N and Annex III 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 the necessary safety and standby devices. This means 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 airline couplings must be incompatible with outlets for other gas systems. The exhaust on all gasoline and diesel compressors shall be separated from the inlet ducts 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. The air 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 shall never be used with airline 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.

a. Prior to using respirators, both supervisors and workers shall be instructed in their selection, use, and maintenance. This may be accomplished by commercial source or by videotapes.

b. As a minimum, the training will include the following:

(1) Instructions on the nature of the hazard involved, whether it is acute or chronic, and an appraisal of what may happen if the respirator is not used or used improperly.

(2) An explanation of why administrative or engineering controls are not feasible.

(3) A discussion of why the respirator selected is the proper one for the hazard involved.

(4) Instructions and training in the actual use of a respirator. This may include an opportunity to:

(a) Handle a respirator.

(b) Have it fitted properly.

(c) Test its facepiece-to-face seal using positive and negative fit test procedures.

(d) Wear it in normal air for an extended familiarization period.

(e) Wear it in a test atmosphere.

(5) Warnings on limitations of respirators:

(a) Air purifying respirators shall not be used in an oxygen deficient atmosphere. Supplied air systems shall be used in such cases.

(b) Particulate removing respirators provide no protection against gases and vapors.

(c) Half mask respirators provide no protection for the eyes.

(d) Chemical cartridges are for specific contaminants at certain concentrations, not all contaminants or very high levels.

(6) A discussion of the factors which may prevent a good face seal:

- (a) Growth of beard.
- (b) Sideburns extending beneath the respirator.
- (c) A cap projecting under the facepiece.
- (d) Temple bars on prescription glasses.
- (e) Dentures.
- (f) Unusual facial configuration.
- (g) Vaseline, facelets, or knitted coverings.

(7) Precautions regarding the use and handling of respirators:

(a) Replace filter cartridges whenever difficulty in breathing is experienced, an odor is noted through the respirator, or at specified intervals for a contaminant without good warning properties.

(b) Perform a positive and negative fit test each time before wearing a respirator.

(c) Modifications of the respirator or straps are unacceptable.

(d) Proper storage of the respirator or facepiece is in an air-tight container or in an uncontaminated area.

(e) The facepiece should be washed and disinfected regularly between uses.

(8) Specific instructions regarding the air supply, hoses, couplings, and warning sounds where an air supplied system is used.

(9) Training on how to handle emergency situations.

8. Use of Respirators.

a. 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) shall be maintained between both or all individuals present.

b. 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.

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

d. If airline 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.

e. **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 as not to adversely affect the seal of the face piece to the face.

9. Respirators.

a. Single-Use Dust/Mist Respirators.

(1) These respirators will be used for airborne dusts and mists with low acute toxicity, which do not irritate the eyes, and where the airborne concentration of the contaminant is not expected to exceed five times the permissible exposure limit. Examples of appropriate uses are for grinding or chipping no-lead paint and for working with wood in a carpentry or cabinet shop. **Inappropriate uses would be for pesticide application and for welding.**

(2) Selection. Approved respirators of this type include:

- | | | |
|-----|--------------|---|
| (a) | AO R1050 | American Optical Company |
| (b) | 3M 8710 | 3M Company |
| (c) | Willson 1400 | Willson Products Division, ESB,
Inc. |

(3) Fitting. Fit testing will not be performed with single-use, dust/mist respirators. Instead, employees will be fully instructed on how to obtain a proper seal across the bridge of the nose and around the face. Whenever the employee or his supervisor has a question about the adequacy of fit for a particular respirator, qualitative fit testing using irritant smoke will be performed. Demonstration posters from manufacturers may be obtained and displayed for the specific respirator used.

b. Cartridge-Type Respirators.

(1) General. With appropriate cartridges these air-purifying respirators can be used for a variety of dusts, mists, gases, and vapors of moderate acute toxicity where the airborne concentration is not expected to exceed ten times the permissible exposure limit. By using full-facepiece models, they can be used with material that irritate the eyes. Examples of appropriate uses of cartridge-type, air-purifying respirators are to reduce solvent exposure during painting in open areas and in pesticide applications. **Inappropriate uses are for spray painting or solvent cleaning in confined spaces, for fire fighting, and for emergency rescue.**

(2) Selection.

(a) Disposable Respirators. Disposable cartridge-type respirators may be used whenever possible to avoid cleaning and maintenance requirements (paragraphs (2)(e) and (2)(f)). These are available in half-mask facepiece styles from various companies.

(b) Reusable Respirators. Air-purifying respirators with reusable facepieces and replaceable cartridges will be used where (1) an adequate fit can not be obtained with a disposable respirator, (2) interchangeability of cartridges is desired, or (3) a full facepiece is necessary. Such respirators are made by several manufacturers in both half and full facepiece styles.

Due to the improved wearer comfort provided, silicone rubber models are preferred. On half facepiece styles, those with a cradle suspension system and split upper straps are more desirable. For full-facepiece respirators, the availability of a nose cup to reduce fogging and of spectacle frames for employees who wear glasses are mandatory. Examples of approved respirators of this type are:

(1) Half-Mask Respirators.

- Equipment. (a) North 7700 Series, North Safety
Appliances. (b) Comfo Classic Series, Mine Safety
(c) A O Quantifit Series, American Optical

(2) Full Facepiece Respirators.

- Equipment. (a) North 7600 Series, North Safety
Appliances. (b) Ultra-Twin Mine Safety

(c) Cartridges. The Program Coordinator will select cartridges and filters that are designed for the contaminant(s) of concern. Manufacturer's literature for the facepiece being used will be consulted for the cartridge selection information. **Cartridges from one manufacturer will not be used with a facepiece from another manufacturer.**

(d) Precluded Contaminants. **Cartridge-type, air-purifying respirators will not be used for gases and vapors that do not have good warning properties or which generate high heats of reaction in the cartridge.** The following is a partial list of gaseous materials that cartridge-type, air-purifying respirators should not be used regardless of the concentration or time of exposure. **This list is not all inclusive** and the Program Coordinator will consult with the manufacturer or a Certified Industrial Hygienist whenever there is a question.

- (1) Acrolein
- (2) Arsine
- (3) Bromine
- (4) Carbon Disulfide
- (5) Carbon Monoxide

- (6) Dimethylaniline
- (7) Dimethyl Sulfate
- (8) Hydrogen Cyanide
- (9) Hydrogen Fluoride
- (10) Hydrogen Selenide
- (11) Hydrogen Sulfide
- (12) Mercury Vapor
- (13) Methyl Bromide
- (14) Methyl Chloride
- (15) Nickel Carbonyl
- (16) Nitro Compounds: Nitrobenzene
Nitrogen Oxides
Nitroglycerin
Nitromethane
- (17) Ozone
- (18) Phosgene
- (19) Phosphine
- (20) Phosphorus Trichloride
- (21) Stibine
- (22) Sulfur Chloride
- (23) Toluene Diisocyanate
- (24) Vinyl Chloride

(e) Oxygen Deficiency. Cartridge-type air purifying respirators do not supply oxygen. They will be used only in well ventilated areas where the oxygen level is not less than 19.5 percent by volume.

(4) Individual Issue. Where practical, respirators will be assigned to employees individually for their exclusive use. The employee's name will be marked on the facepiece. Exchanging respirators or assigning one respirator for use by several employees is unacceptable unless proper fit testing is done, cartridges are changed, and the facepiece is cleaned before use.

(5) Fitting. With the initial issue of a cartridge-type respirator, the Program Coordinator will ensure that it is fit tested on the employee. A variety of facepieces of different makes and sizes will be presented by the Program Coordinator to the employee for initial fitting (a medium size respirator will fit the majority of employees). The employee will select the facepiece that fits his face best based on negative and positive air pressure checks. The fit will be confirmed qualitatively using an irritant

smoke around the facial seal of the respirator. If a satisfactory fit cannot be obtained with a half-mask facepiece, then a full facepiece will be fit tested and used if a good fit is obtained. Fit testing for each employee using a cartridge-type respirator will be documented.

(a) Negative Pressure Test. This test can be performed on any respirator with an intake that can be covered with the palm of the hand. The employee dons the facepiece and covers the intake with his hands. He inhales so that the facepiece collapses slightly and holds his breath for ten (10) seconds. If the facepiece remains slightly collapsed and no inward leakage or air is noted, the face seal is considered satisfactory.

(b) Positive Pressure Test. With the facepiece on the exhalation valve closed by covering it the his or her hand, the employee exhales gently into the facepiece. The fit is considered satisfactory if a slight positive pressure can be maintained inside the facepiece and there is no evidence of outward leakage.

(5) Cleaning. Reusable respirators will be cleaned and disinfected after each day's use for those assigned individually and between uses for those used commonly. Cleaning will be the responsibility of the user. The Program Coordinator or his supervisor will show each employee how to clean his respirator in warm water with a mild detergent containing a bactericide as recommended by the manufacturer. After rinsing, respirators will be allowed to air dry in an uncontaminated area. During extended periods of use, towelettes soaked in alcohol may be used to clean the respirators during breaks.

(6) Maintenance. The employee and his supervisor prior to each use will do inspection of the respirators for defects. The primary problems that might be encountered and corrective actions, where appropriate, are as follows:

(a) Facepiece - check for:

(1) Excessive dirt (clean all dirt from facepiece).

(2) Cracks, tears, or holes (obtain new facepiece).

(3) Distortion (allow facepiece to "sit" free from any constraints and see if distortion disappears; if not, obtain new facepiece).

(4) Cracked, scratched, or loose fitting lenses (contact manufacturer to see if replacement is possible; otherwise, obtain new facepiece).

(b) Headstraps - check for:

(1) Breaks or tears (replace headstraps).

(2) Loss of elasticity (replace headstraps).

(3) Broken or malfunctioning buckles or attachments (obtain new buckles).

(4) Allows the facepiece to slip (replace headstraps).

(c) Inhalation valve, exhalation valve - check for:

(1) Detergent residue, dust particles, or dirt on valve or valve seat (clean residue with soap and water).

(2) Cracks, tears or distortion in the valve material or valve seat (contact manufacturer for instructions).

(3) Missing or defective valve cover (obtain valve cover from manufacturer).

(d) Filter element(s) - check for:

(1) Proper filter for the hazard.

(2) Approval designation.

(3) Missing or worn gaskets (contact manufacturer for replacement).

(4) Worn threads - both filter threads and facepiece threads (replace filter or facepiece, whichever is applicable).

(5) Cracks or dents in filter housing (replace filter).

(7) Storage. Each employee will be issued a recloseable plastic bag in which to seal their respirator or facepiece. The respirators will be stored in a noncontaminated area so that the facepiece and exhalation valve are not distorted. They will not be hung by their straps.

c. Self-Contained Breathing Apparatus.

(1) General. Self-contained breathing apparatus (SCBA) shall be used where the airborne concentration of the contaminant is high or there is an oxygen deficiency. These devices supply breathing air for a limited period and will be used only for emergency situations or short-term exposures. Examples of appropriate use of SCBA are for fire fighting and emergency rescue. **To use such devices for continued work at high exposure levels (e.g. spray painting in a confined space) would be inappropriate.** Also, SCBA does not provide skin protection and full protective clothing should be used where liquid material might be encountered that is toxic through skin absorption.

(2) Selection. Examples of approved SCBAs are as listed below:

(a) Air Pak II, Scott Aviation.

(b) North 800, North Safety Equipment.

(c) Air Mask Model 401, Mine Safety Appliances.

(3) Training. Special training is required for employee assigned to use SCBA. Whenever possible, initial training shall be obtained from a local fire department that uses such equipment and is willing to provide instruction. Slide or tape presentations and video cassettes are available from SCBA vendors and will be used for refresher training. Actual hands-on practice will be done at least annually.

(4) Cleaning and Maintenance.

(a) Facepieces shall be cleaned after each use prior to storage. Breathing air cylinders shall be refilled after each use.

(b) Since SCBA are intended for emergency use, they must be inspected regularly. The Project Program Coordinator shall do this monthly. The checklist contained in Annex IV of this Appendix will be used. Any deficiencies noted will be corrected as soon as possible.

(5) Storage. As a minimum, at locations using SCBA, two will be available. These will be stored in their original suitcases in separate locations no more than five minutes apart by foot.

d. Supplied Air Respirators.

(1) General. The use of supplied air or airline respirators shall be limited to special situations where continued activity is necessary in oxygen deficient or highly contaminated atmospheres. Examples of such situations are spray painting in small, unvented rooms and removal of asbestos insulation.

(2) Selection.

(a) Facepiece. Full facepiece masks of the pressure demand or continuous flow type will be used. Examples of such facepieces are:

- | | |
|------------------------|------------------------|
| (1) North 85200 Series | North Safety Equipment |
| (2) Ultravue | Mine Safety Appliances |

(b) Air Supply. Air may be provided from a tank of compressed air cylinders or a compressor. In either case, the air provided to the respirator facepiece will meet certain quality parameters (paragraph d(3)). If compressed air cylinders are used, the procurement document will include specifications for air quality and cylinder pressure testing. If an air compressor is to be used, it should be a separate, dedicated unit rather than regularly available "plant" air. In either case, air purification and safety devices will be installed (paragraph d(4)).

(3) Air Quality. Air supplied to the facepieces will be Type I, Grade D breathing air or better in quality. This means that contaminant concentrations are limited as follows:

(a)	Oxygen	19.5 - 23.5%
(b)	Carbon Monoxide	20 ppm or less
(c)	Carbon Dioxide	1,000 ppm or less
(d)	Oil Mist	5 mg/m ³ or less
(e)	Odor	Not objectionable or pronounced

The Program Coordinator will test air coming from the compressor as delivered to the facepiece at least semiannually to ensure that it meets these quality standards. Testing will be done using an accredited testing laboratory. A copy of the results will be forwarded to the SOHO for 40 year retention as required.

(4) Compressor Requirements. The general requirements for compressors supplying breathing air are:

(a) The compressor inlet must be located in an area free from contamination. If outside, areas near and down wind from exhaust ducts/stacks and sources of vehicle exhaust should be avoided. If inside, areas with little air circulation, high temperatures, solvent use, combustion equipment, or other potential sources of contamination should be avoided.

(b) The compressor must have a failure alarm and high temperature alarm or shut off.

(c) Water trap and air purification system are required for the removal of condensed water, oil mist and other particulates, odors, gases and organic vapors.

(d) A continuous carbon monoxide alarm or a carbon monoxide converter should be used.

(e) In work where the atmosphere would be immediately dangerous to life, the air receiver must be of sufficient capacity to allow respirator wearer(s) to escape from contaminated atmosphere in event of compressor failure. Alternatively, a backup air supply system will be provided that will automatically activate should the primary system fail.

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(f) Should plant air be used, only breathing air type lines are permitted downstream from the purification system.

(5) Maintenance. Prior to use, the employee and his supervisor will inspect the facepieces, hoses, and air supply system for defects. Problems that might be encountered are:

(a) Check facepiece, headstraps, valves, and breathing tubes, as for air purifying respirators.

(b) Hood, helmet, blouse, or full suit - if applicable check for:

(1) Headgear suspension (adjust properly for you).

(2) Cracks or breaks in faceshields (replace faceshield).

(3) Protective screen to see that it is intact and fits correctly over the faceshield, abrasive blasting hoods, and blouses (obtain new screen).

(c) Air supply system - check for:

(1) Breathing air quality.

(2) Breaks or kinks in air supply hoses and end fitting attachments (replace hose and, or fitting).

(3) Tightness of connections.

(4) Proper setting of regulators and valves (consult manufacturer's recommendations).

(5) Correct operation of air-purifying elements and carbon monoxide or high temperature alarms.

Maintenance will be performed on the compressor and air purification system according to the manufacturer's guidelines. This will include calibration of the carbon monoxide alarm for the activation at 20 PPM or higher.

(6) Storage. Facepieces and hoses will be stored in recloseable plastic bags in uncontaminated areas when not in use. They will be arranged so that distortion of the rubber parts does not occur.

10. Recordkeeping. the Program Coordinator at each facility will maintain records of the respiratory protection program as implemented. These records will include:

- (1) Respirator selection questionnaires (Annex II).
- (2) Users lists (Annex V).
- (3) Fitting and training records, ENG Form 4937, May 1986 (Annex VI).
- (4) Inspection sheets for SCBA (Annex IV).
- (5) Compressed air checks (Copy to SAWSO).

The District's Medical Surveillance Contractor will maintain original records of employee medical evaluations.

11. Medical Requirements. All users of respirators shall be participants of the District's medical surveillance program. No employee shall be assigned 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 if 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 that 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 who's 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.

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12. Program Evaluation. The Facility Manager or Program Coordinator in conjunction with the SOHO will periodically evaluate the entire respiratory protection program to ensure its continued effectiveness. This evaluation will include unannounced inspections, a review of records, and discussion with employees. Areas to be covered are shown in Appendix B - General Guidelines for Program Evaluations, ER 385-1-90. Deficiencies will be recorded. Reports of these evaluations, conclusions, and corrective actions will be kept in the SOHO.

ANNEX I

RESPIRATORY PROTECTION PROGRAM COORDINATOR

Facility: _____

Program Coordinator: _____

Normal Job Title: _____

Date of Assignment: _____

Facility Supervisor

Date

ANNEX II

QUESTIONNAIRE

RESPIRATOR RECOMMENDATION

Facility: _____

Individual Seeking Recommendation: _____

Operation Involved: _____

Name of User: _____ Phone Number: _____

1. Material:

(a) Chemical Name: _____

(b) Trade Name: _____

(c) Formula: _____

(d) TLV or TWA: _____ OSHA 1910.1000 _____ Current ACGIH _____

2. Form in which it will be used:

Liquid _____ Solid _____ Gaseous _____ (If so, is it an organic
vapor? _____) Acid Gas _____ Other _____

3. Maximum expected concentration:*

(a) _____ parts per million.

(b) _____ milligrams per cubic meter.

4. Will material be heated? _____ If so, to what
temperature? _____ °F.

5. What is the odor threshold of the material? * _____

*Consult Material Safety Data Sheet (MSDS) and contact SAWSO as
necessary.

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6. At what concentration is the material considered to be immediately dangerous to life or health?* _____

7. Can the substance be absorbed through the skin? _____
8. Irritant to eyes? _____ Respiratory tract? _____
Skin? _____
9. At what concentration is it an irritant?* _____
10. If the substance is known to be flammable, what are the lower and upper flammable limits, in percent by volume?* _____

11. What is the vapor pressure of the material?* _____
12. Will material be mixed with other chemicals? _____ If so,
give details: _____

13. Any possibility of oxygen deficiency? _____
14. Can good ventilation of the area be maintained? _____
15. Will exposure be continuous? _____ Or intermittent? _____
16. Will the respiratory device be used for routine exposures, or will it be used as an escape device? _____

17. Provide as much detail as possible concerning exposure conditions. _____

18. Provide illustrations of work area showing equipment, materials storage locations, etc. _____

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Suggested respiratory protection device based on above information:

Comments: _____

Signed: _____

Dated: _____

ANNEX III
RESPIRATOR SELECTION GUIDE

HAZARD	TYPE OF RESPIRATOR
<u>GASES OR VAPORS</u>	
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 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 or facepiece respirator with chemical cartridges or canister.
<u>PARTICULATES</u>	
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.

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COMBINATION GASES, VAPORS
AND 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 or
facepiece respirator with chemical
cartridges or canister and appropriate
filters.

ANNEX IV

SELF-CONTAINED BREATHING APPARATUS INSPECTION SHEET

Device: _____ S/N: _____

Date Inspected: _____ Inspected By: _____

Location: _____ User Group: _____

Person Responsible for monthly Inspection: _____

CHECKLIST

Facepiece: _____ Fogproof: _____

Head Harness: _____ Air Cylinder Pressure: _____

Hose: _____ Cylinder Valve: _____

"O" Ring (Ref. Connector): _____ Bypass Valve: _____

Inhalation Valve: _____ Mainline Valve: _____

Exhalation Valve: _____ Pak Alarm: _____

Facepiece Lens: _____ Regulator Diaphragm: _____

Harness: _____ Regulator Function: _____

Backpack: _____ Demand: _____

Cleanliness: _____ Pressure Demand: _____

Instruction Sheet: _____ Storage Box: _____

Wrench: _____

Comments:

ANNEX V
RESPIRATOR USERS LIST

Facility: _____

<u>Job or Operation</u>	<u>User</u>	<u>Approved Respirator</u>
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Program Coordinator: _____

Issue Date: _____

Supercedes: _____

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ANNEX VI
ENG FORM 4937, RESPIRATORY FIT TEST/TRAINING RECORD

RESPIRATORY FIT TEST/TRAINING RECORD <small>(ER 385-1-90)</small>			BEFORE COMPLETING THIS FORM, PLEASE READ THE PRIVACY ACT STATEMENT ON REVERSE SIDE.			
EMPLOYEE'S NAME <i>(Type or Print)</i>			SOCIAL SECURITY NO.			
FIELD OPERATING ACTIVITY		PROJECT/AREA OFFICE	JOB TITLE			
PRESCRIPTION GLASSES REQUIRED YES <input type="checkbox"/> NO <input type="checkbox"/>		SUPERVISOR'S NAME	TELEPHONE NO.			
RESPIRATOR(S) TESTED: <i>(List initial and annual fit tests)</i>						
1	MANUFACTURER/TYPE/MODEL/SIZE		METHOD ¹	RESULT ²	ISSUED ³	DATE TESTED
	DATE/RESULT MED. EVAL. ⁴	TESTER'S NAME		EMPLOYEE SIGNATURE		
2	MANUFACTURER/TYPE/MODEL/SIZE		METHOD ¹	RESULT ²	ISSUED ³	DATE TESTED
	DATE/RESULT MED. EVAL. ⁴	TESTER'S NAME		EMPLOYEE SIGNATURE		
3	MANUFACTURER/TYPE/MODEL/SIZE		METHOD ¹	RESULT ²	ISSUED ³	DATE TESTED
	DATE/RESULT MED. EVAL. ⁴	TESTER'S NAME		EMPLOYEE SIGNATURE		
4	MANUFACTURER/TYPE/MODEL/SIZE		METHOD ¹	RESULT ²	ISSUED ³	DATE TESTED
	DATE/RESULT MED. EVAL. ⁴	TESTER'S NAME		EMPLOYEE SIGNATURE		
5	MANUFACTURER/TYPE/MODEL/SIZE		METHOD ¹	RESULT ²	ISSUED ³	DATE TESTED
	DATE/RESULT MED. EVAL. ⁴	TESTER'S NAME		EMPLOYEE SIGNATURE		
¹ METHOD(S): a-Banana Oil, b-Irritant Smoke, c-Quantitative <i>(Specify)</i> _____ ² RESULT: Pass, Fail ³ ISSUED: Yes, No ⁴ MEDICAL EVALUATION RESULT: Can, Cannot, Limited <i>(Specify)</i> _____						
OTHER PERSONAL PROTECTIVE EQUIPMENT <i>(Which must interface with the respirator):</i> <input type="checkbox"/> Safety Glasses <input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hard Hat <input type="checkbox"/> Welding Helmet <input type="checkbox"/> Earmuffs <input type="checkbox"/> Other <i>(Specify)</i> _____						
NOTE: No person having facial hair which interferes with the sealing surface or valve function of the respirator will be fit tested with or issued a negative pressure respirator. Presence of facial hair <i>(Specify)</i> : _____						
REMARKS						
TRAINING <i>(List initial and annual update training)</i>						
DATE	MONITOR	TYPE (1-6) ⁶	EMPLOYEE'S SIGNATURE			
⁶ VIDEO TAPES: 1-Intro, 'End User', 2-Air Purifying, 3-Air Supplying, 4-Fit Testing OTHER: 5-Specify _____ 6-Specify _____						

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The following information is provided in accordance with the requirements of the Privacy Act of 1974 (See Ar 340-21).

**NOTICE TO EMPLOYEES REQUIRED
TO BE FIT TESTED WITH RESPIRATORS**

Fit Test Authority: 5 CFR 339.301 29 CFR 1910.134 and ER 385-1-90.

Purpose: The individual Respiratory Fit Test/Training Record serves as the document that provides respiratory protection fit test information accumulated during fit testing of Corps employees and other designated individuals. The document also serves as a historical record of an employee's participation in Corps respirator fit testing programs.

Routine Use: Information from an employee's respiratory protection record (1) to determine if an employee can obtain a viable fit test and is able to safely perform his/her assigned tasks while wearing respiratory protective devices, (2) to provide to physicians of employees included in programs of medical surveillance to evaluate criteria contained in 29 CFR 1910.134, and (2) accumulate, review and file the record at the employee's work location and the FOA Safety and Health office. A copy of the record shall be placed in the employee's official medical record file in the Personnel Office.

Disclosure: The refusal to provide this information may result in such measures as the employee not being able to continue performing his/her assigned job duties and responsibilities and may be subject to administrative penalties.

ANNEX VII

PROTECTION FACTORS FOR PARTICULATE
FILTER RESPIRATORS

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

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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.

ANNEX VIII
PROTECTION FACTORS FOR GAS
OR
VAPOR RESPIRATORS

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

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

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- 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 of 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 facepiece supplied-air respirators should not be used in any atmosphere that is immediately dangerous to life or health unless it is equipped with an auxiliary air tank that can be operated in the positive pressure mode.
 4. Air purifying respirators cannot be used for contaminants having inadequate warning properties.

IRRITANT SMOKE FIT TEST PROCEDURE

1. RESPIRATOR SELECTION

a. The test subject shall be allowed to select the most comfortable respirator from a large array of various sizes and manufacturer that includes at least three sizes of elastomeric half facepieces and unit of at least two manufacturers.

b. The selection process shall be conducted in a room separate from the fit-test chamber to prevent odor fatigue. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to assess a "comfortable" respirator. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This may not constitute his formal training on respirator use, only a review.

c. The test subject should understand that he is being asked to select the respirator that provides the most comfortable fit for him. Each respirator represents a different size and shape, and if fit properly will provide adequate protection.

d. The test subject holds each facepiece up to his face and eliminates those that are obviously not giving a comfortable fit. Normally, selection will begin with a half-mask and if a fit cannot be found, the subject will be asked to go to the full facepiece respirator. (A small percentage of users will not be able to wear any half-mask respirator.)

e. The most comfortable facepieces are recorded; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in No. 6 below. If the test subject is not familiar with using a particular respirator, he shall be directed to don the mask several times and to adjust the straps each time, so that he becomes adept at setting proper tension on the straps.

f. Assessment of comfort shall include reviewing the following points with the test subject:

1. Chin properly placed.
2. Positioning of mask on nose.

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3. Strap tension.
4. Fit across bridge of nose.
5. Room for safety glasses.
6. Tendency to slip.
7. Cheeks filled out.
8. Self-observation in mirror.
9. Adequate time for assessment.

g. The test subject shall conduct the conventional negative and positive pressure fit checks (i.e., see ANSI Z88.2.1980). Before conducting the negative or positive pressure checks, the subject shall be told to "seat" his mask by rapidly moving the head side to side and up and down, taking a few deep breaths.

h. The test subject is now ready for fit testing.

i. After passing the fit test, the test subject shall be questioned again regarding the comfort of the respirator. If it has become uncomfortable, another model of respirator shall be tried.

j. If during the first two weeks of on-the-job wear, the chosen facepiece becomes unacceptably uncomfortable, the employee shall be given the opportunity to select a different facepiece.

2. Fit Test - Irritant Smoke Procedure

a. The test subject shall be allowed to smell a weak concentration of the irritant smoke to familiarize him with its characteristic odor.

b. The test subject shall properly don the respirator selected as above, and wear it for at least ten minutes before starting the fit test.

c. The test conductor shall review this protocol with the test subject before testing.

d. The test conductor shall perform the conventional positive pressure and negative pressure fit checks. Failure of either check shall be cause to select an alternate respirator.

e. Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part No. 5645, or equivalent. Attach a short length of tubing to the end of the smoke tube. Attach the other end of the smoke tube to a low-pressure air pump set to deliver 200 milliliters per minute.

f. Advise the test subject that the smoke can be irritating to the eyes and instruct him to keep his eyes closed while the test is performed.

g. The test conductor shall direct the stream of irritant smoke from the tube towards the face seal area of the test subject. He shall begin at least 12 inches for the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

h. The following exercises shall be performed while the smoke is challenging the respirator seal. Each shall be performed for one minute.

(1) Normal breathing.

(2) Deep breathing. Be certain breaths are deep and regular.

(3) Turning head from side to side. Be certain movement is complete. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his head is at either side.

(4) Nodding head up and down. Be certain motions are complete. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his head is in the fully up position.

(5) Talking - slowly and distinctly, count backwards from 100.

(6) Normal breathing.

i. If the irritant smoke produces an involuntary reaction (cough) by the test subject, the test conductor shall stop the test. In this case, the tested respirator is rejected and another respirator shall be selected.

j. Each test subject passing the smoke test without evidence of a response shall be given a sensitivity check of the smoke from the same tube to determine whether he reacts to the smoke. Failure to evoke a response shall void the test.

k. Steps d, g, and h of this protocol shall be performed in a location with the exhaust ventilation sufficient to prevent general contamination of the testing area by the test irritant smoke.

l. Respirators successfully tested by the protocol may be used in contaminated atmospheres up to ten times the PEL. In other words, this protocol may be used to assign protection factors not exceeding ten.

SACCHARIN SOLUTION AEROSOL FIT TEST PROCEDURE
(Secondary or Alternative Procedure)

1. Test threshold Screening

a. Threshold screening as well as fit testing employees shall use an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movement of the head when a respirator is worn. An enclosed substantially similar to the 3M hood assembly of part # FT 14 and FT 15 combined is adequate.

b. The test enclosure shall have a 3/4-inch hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

c. The entire screening and test procedure shall be explained to the test subject prior to the conduct of the screening test.

d. The test subject shall don the test enclosure. For the threshold-screening test, he shall breathe through his open mouth with tongue extended.

e. Using a DeVilbiss Mode 40 Inhalation Medication nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. The nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

f. The threshold check solution consists of 0.83 grams of sodium saccharin, USP in water. It can be prepared by putting 1 cc of test solution (see 3f below) in 100 cc of water.

g. To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely then released and allowed to fully expand.

h. Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted.

i. If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

j. If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

k. The test conductor will take note of the number of squeezes required to elicit a taste response.

l. If the saccharin is not tasted after 30 squeezes (step j), the test subject may not perform the saccharin fit test.

m. If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

n. Correct use of the nebulizer means that approximately 1 cc of liquid is used at a time in the nebulizer body.

o. The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon, or at least every four hours.

2. Respirator Selection. Respirators shall be selected as described in the irritant smoke fit test procedure.

3. Fit Test.

a. The fit test uses the same enclosure described in 1a and 1b above.

b. Each test subject shall wear his respirator for at least 10 minutes before starting the fit test.

c. The test subject shall don the enclosure while wearing the respirator selected in paragraph 1 above. This respirator shall be properly adjusted and equipped with a particulate filter cartridge.

d. The test subject may not eat, drink (except plain water), or chew gum for 15 minutes before the test.

e. A second DeVilbiss model 40 Inhalation Medication nebulizer or equivalent shall be used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

f. The fit test solution is prepared by adding 83 grams of sodium saccharin to 100cc of warm water.

g. The test subject shall breathe through the open mouth with tongue extended.

h. The nebulizer shall be inserted into the hole in the front of the enclosure and the fit test solution shall be sprayed into the enclosure using the same technique as for the taste threshold screening and the same number of squeezes required to elicit a taste response in the same screening.

i. After generation of the aerosol, the test subject shall be instructed to perform the following exercises for one minute each.

(1) Normal breathing.

(2) Deep breathing. Be certain breaths are deep and regular.

(3) Turning head from side-to-side. Be certain movement is complete. Alert the test subject not to bump the respirator on the shoulders. Have the test subject inhale when his head is at either side.

(4) Nodding head up-and-down. Be certain motions are complete. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his head is in the fully up position.

(5) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the Rainbow Passage. Reading it will result in a wide range of facial movements, and thus be helpful to satisfy this requirement. Alternative passages that serve the same purpose may also be used.

Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

j. Every 30 seconds, the aerosol concentration shall be replenished using one-half the number of squeezes as initially.

k. The test subject shall so indicate to the test conductor if at any time during the fit test the taste of saccharin is detected.

l. If the saccharin is detected the fit test is deemed unsatisfactory and a different respirator shall be tried.

m. Successful completion of the test protocol shall allow the use of the tested respirator in contaminated atmospheres up to 10 times the PEL. This protocol may used to assign protection factors no higher than ten.

APPENDIX P
HEARING CONSERVATION

1. Purpose. This chapter implements hearing conservation policy and guidance for personnel of the Wilmington District.

2. Applicability. This chapter applies to all elements of the Wilmington District.

3. References.

- a. ER 385-1-89, Hearing Conservation.
- b. EM 385-1-1, Safety and Health Requirements Manual.
- c. EP 385-1-58, Medical Surveillance.
- d. MIL STD 1472C, Human Engineering.
- e. MIL STD 1474B, Noise Limits.
- f. TB MED 501, Hearing Conservation.
- g. 29 CFR 1910.95, OSHA, Occupational Noise Exposure.
- h. 29 CFR 1926.52, OSHA, Occupational Noise Exposure.

4. Background.

a. Employees subjected to noise levels specified in CFR 1910.95 are required to be provided with hearing protection. When feasible, engineering controls shall be utilized to reduce the noise level.

b. Key elements in an industrial hearing conservation program are: noise measurement, use of engineering controls, use of personnel protective equipment, educational programs for employees, and audiometric testing.

4. General. Personnel working in areas where noise levels cannot be reduced below 85 dbA, regardless of length of exposure, shall be provided with ear plugs and/or ear muffs. Ear plugs properly used will attenuate approximately 30 dbA and ear muffs in good condition and properly used will attenuate approximately 20 dbA. Example: personnel working in a noise environment of 105 dbA must use hearing protection to reduce or attenuate 20 dbA from the 105 dbA noise level.

a. A physician, audiologist, or certified audiometric technician shall accomplish audiometric testing of employee.

b. Qualified personnel will analyze audiograms.

c. The employee shall be notified of any significant (15-20 dbA) threshold shift in hearing level.

d. A general "rule of thumb" in determining noise hazard areas is as follows: when the noise level makes it difficult to hold a normal conversation at close range using normal voice level, the area should be considered to be noise hazardous.

e. Some exposures that should be classified as noise hazardous include the following:

- (1) Powered tools including chainsaws.
- (2) Construction equipment.
- (3) Dredge pump and engine rooms.
- (4) Power Generators.
- (5) Air compressors.
- (6) Grass mowing equipment.

5. Responsibilities.

a. Supervisors shall:

(1) Be familiar with and implement the criteria established in this Appendix. They shall identify areas where employees are exposed to high noise levels; post those areas as

noise hazardous areas; develop, where feasible, engineering controls; educate on prevention of hearing loss; educate on and enforce the use of personal protective equipment. Noise hazards shall be included in the Position Hazard Analysis.

(2) Notify the Safety Office of suspected noise hazardous areas. The notification shall include the noise hazard involved, type of work done, and any action taken to eliminate the hazard. The Safety 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) shall 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 and will be entered into the District's Medical Surveillance Program.

(3) Requisition hearing protection equipment with the appropriate noise reduction level.

(4) Ensure that hearing protection devices conforming to ANSI S3.19 are issued and used by employees exposed to noise hazard areas.

(5) Ensure that applicable job descriptions contain the requirement that employees must wear hearing protection in the performance of their job.

(6) Ensure that employees receive orientation and ongoing training on hearing conservation.

(7) Ensure that employees exposed to a noise hazardous environment are included in the Districts Medical Surveillance Program. Baseline audiograms shall be administered to new and reassigned employees prior to assignment, but in no case later than 60 days after assignment.

b. Chief, Safety Office shall:

(1) Conduct noise surveys of known or suspected noise hazardous areas. Maintain records for 40 years.

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(2) Monitor the program to ensure effective implementation and administration, to include retesting as required by program criteria or competent medical authority.

(3) Review analysis of audiograms.

(4) Provide supervisors with the requirements for further medical attention if indicated by analysis of baseline or follow-up audiogram.

(5) Arrange for annual audiograms for all employees exposed to noise levels above 85 dbA and for all employees required to wear hearing protective devices because of hearing deficiencies.

(6) Arrange for termination audiograms for all employees exposed to noise levels above 85 dbA that leave the District.

c. Employees shall:

(1) Wear proper hearing protection when exposed to noise environments exceeding 85 dbA or when directed by supervision.

(2) Report for audiometric testing when required.

APPENDIX Q
UNDERWATER DIVING OPERATIONS

1. Purpose. This regulation prescribes policies and procedures for underwater diving operations.
2. Applicability. This regulation is applicable to all Government and Contractor activities under the jurisdiction of the Wilmington District.
3. References.
 - a. EM 385-1-1, U.S. Army Corps of Engineers Safety and Health Requirements Manual.
 - b. U.S. Navy Diving Manual, Volumes I and II.
 - c. Commercial Diving Operations, Occupational Safety and Health Standards, 29 CFR 1910, Subpart T.
 - d. Consensus Standards for Commercial Diving Operations, Association of Diving Contractors (ADC), United States of America.
 - e. Commercial Diving Operations, United States Coast Guard.
 - f. The National Oceanic and Atmospheric Administration (NOAA) Diving Manual, Diving for Science and Technology.
4. Definitions. This regulation defines specific terms as used in the Wilmington District. Also, reference EM 385-1-1 and OSHA 29 CFR 1910 for definition of general terms in diving operations.
 - a. Diving Contractor - any company, whether serving as a prime or sub-contractor, performing underwater operations utilizing alternate air sources to accomplish mission objectives.
 - b. Government Diver - any governmental agency, which provides diving team services for the District, such as but not limited to Navy, Army, Marines, Air Force, Coast Guard and NOAA.

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c. Construction Diver - any diver working in conjunction with marine construction, dredging operations, engineering yard operations, dam operations, and/or operations involving environment restrictions within Reference a. This includes confined space entry, crane operations, and mechanical systems requiring lock out/tag out procedures, and any other situations as declared by the District Diving Coordinator.

d. Scientific Diver - any diving operation required in conjunction with biological sampling and collection, and archaeological studies.

e. Diving Operation Inspection - utilization of a qualified COE diving inspector throughout the diving period, e.g., construction diving, hazardous environment diving, diving operations of less than 3 days or as determined by District Diving Coordinator (DDC) or Alternate District Diving Coordinator (ADDC).

f. Diving Operation Monitoring - utilization of a qualified COE diving inspector, who conducts an initial diving inspection meeting and then periodically inspects the diving operation. Monitoring is at the discretion of the DDC/ADDC, and is, at a minimum, for diving projects exceeding 3 days of operations, an operation that offers minimal opportunity for a diving accident, and/or an operation utilizing Government Divers.

5. Policy. All Wilmington District diving operations shall be conducted in a manner that will maximize efficiency and minimize the potential for personal injury, loss of life, occupational illness, and/or property damage. The District supports and emphasizes Paragraph 30.A.01 of EM 385-1-1, that diving shall not be utilized if the work objective can be more safely and efficiently accomplished by another means. Construction divers shall utilize surface-supplied air systems with diver/surface two-way voice communications. The District also encourages that all other divers, whether Government or scientific, utilize surface-supplied air systems as well. All diving operations will be subject to review and acceptance by the DDC/ADDC prior to commencement of any diving operation. In the absence of the DDC and ADDC, the dive inspector thoroughly familiar with the nature of the dive or another SAD District DDC will review the dive plan for compliance. Additionally, the DDC/ADDC will be notified and

dive plans submitted for all diving operations conducted by military dive teams. All diving operations will be inspected and/or monitored by qualified diving inspectors, in which the frequency of inspection will be determined by the DDC/ADDC during the dive plan review period. Any failure to meet the requirements stated herein or as referenced will be cause for delay or cessation of diving operations.

7. General.

a. Contracts issued for work or services within the District will reference this regulation whenever diving operations are anticipated as part of the contract work. It must be realized that diving is an inherently hazardous activity. Each dive operation will be carefully planned and executed according to the accepted dive plan. Each diving operation will be properly supported with adequate contractor personnel. Budget and schedule requirements, while a consideration in scheduling a dive, are not justification to deviate from dive safety measures. Only in the event of immediate life threatening situations may deviation of Standard Dive Practices occur from the accepted dive plan.

b. The Diving Contractor is responsible for diving efficiently and safely adhering to all applicable regulations and the accepted dive plan. Where a difference in standards exists, the most conservative shall apply. Divers will ensure the following:

(1) Commercial diving companies may be pre-qualified prior to commencing diving operations for the District. In order to be found qualified, the diving company must have a demonstrated knowledge and expertise in the type of diving operation to be performed, as set forth by industry standard and approved by the DDC.

(2) Divers shall have documented training and experience for the diving operation. Recreational dive training such as PADI, NAUI, SSI and YMCA is not in itself considered adequate training for commercial diving activities. A lack of experience or qualification to perform the task will be cause for rejection of the dive plan.

(3) Divers shall be qualified by a licensed physician to be fit for diving and shall be stated as such on their physicals. Currency of physicals will be within a year of the diving operation.

(4) Dive tenders shall have documented training and experience in the task assigned.

(5) All dive team members shall be currently certified by a nationally recognized organization in CPR and First Aid. At least two members shall be certified in oxygen first aid and have thorough knowledge of the oxygen system they utilize.

(6) All diving operations at a minimum will conform to EM 385-1-1, APPENDIX 30.

(7) All diving equipment furnished by the contractor will be identified in the dive plan and will comply with EM 385-1-1. During Surface Supplied Air operations, SCUBA will not be allowed as equipment for the stand-by diver. Use of SCUBA on any operation will be by DDC approval only.

(8) A diving craft of ample size to support the diving operation will be available for all dives as determined by the DDC. The type craft to be used will depend upon the location of the dive, number of personnel, and weather conditions. In addition to the dive team and vessel Captain, adequate space shall be made available for the diving inspector. As a minimum, the craft will be equipped with adequate first aid supplies, VHF marine radio capable of hailing channel 16, and a dive ladder and/or platform for safe entry and exit of the diver from the water.

(9) The international (ALPHA) and sport diver flags will be displayed in the direct vicinity of the diving operation when there are divers in the water.

(10) At no instances will free diving (breathhold) techniques be employed.

(11) Divers will wait 24 hours before flying after a dive.

(12) Copies of all dive logs will be submitted to the Safety Office.

(13) Submits three (3) copies of Safe Practices Manual, as written in compliance with ADC, fifteen (15) days prior to any diving operation for acceptance. The Diving Contractor will also provide updated versions to the Wilmington District when there are changes in operation, organization, personnel, and/or equipment. Copies will remain on file in the District Safety Office, with the DDC, and with the ADDC. A copy of the manual will be available by the contractor for use by all dive team members on all dive sites.

(14) Submits a dive plan for each diving activity for review and acceptance by the DDC/ADDC, and immediately advises both diving inspector and DDC/ADDC of changes that occur in the accepted dive plan. Additionally, in the development of the dive plan, consideration must be given to the environment where diving operations will be conducted, especially in terms of harmful materials that may be present in the water.

c. COE personnel involved in diving operations shall demonstrate the following:

(1) Personnel interested in performing duties as DDC, ADDC, and Inspectors should have at a minimum a basic SCUBA certification to ensure they have a basic knowledge of the hyperbaric and environmental conditions that Diving Contractors may experience. Names of personnel, who are considered for the diving program, will be submitted to and approved by the DDC, ADDC, and Safety Officer, prior to requesting prospect training. Diving Inspectors are required to attend and successfully complete a one (1) week PROSPECT course for Diving Inspector prior to conducting inspections for the District. Recertification is required every four (4) years. DDC and ADDC are required to attend either the three (3) week Diving Supervisor PROSPECT course or the four (4) week Diving Safety PROSPECT course. Recertification is required every four (4) years by attending the two (2) week Diving Refresher PROSPECT course.

d. The Commander will appoint a District Diving Coordinator and alternate who is responsible for organizing, integrating and monitoring the total dive program within the District. The DDC and ADDC must have completed the HQUSACE Dive Safety training. Duties include:

- (1) Reviews all Safe Practices Manuals.
- (2) Establishes District Dive Policy and ensures regulations are kept updated.
- (3) Reviews medical certificates.
- (4) Reviews all applicable contracts to ensure dive requirements are included.
- (5) Reviews dive team qualifications and experience to ensure compliance with EM 385-1-1.
- (6) Advises project managers on alternatives to and methods of diving.
- (7) Reviews all dive plans for acceptance.
- (8) Ensures when dive operations in the District are physically monitored.
- (9) Ensures the District has ample personnel trained as diving inspectors to monitor dive operations.
- (10) Performs Dive Inspector duties when necessary.
- (11) Ensures that all assigned personnel have appointment letters.
- (12) Conducts periodic Dive Inspector continuing education.

e. The Commander will appoint District Diving Inspectors. The diving inspector is the District representative at the dive site. The diving inspector is responsible for ensuring that the dive operation is adequately planned, equipped and staffed in accordance with the accepted dive plan. The diving inspector has

the authority to delay or stop a dive at anytime. The diving inspector's sole responsibility is the safe conduct of the diving operation. The diving inspector must have completed the required HQUSACE approved training. A waiver may be granted by the DDC until training is scheduled, if the candidate demonstrates extensive dive training and experience as represented by military records or commercial certifications. Duties include:

- (1) Ensures adequacy of specified equipment.
- (2) Ensure compliance with accepted dive plan.
- (3) Requests changes of accepted dive plans with recommendations.
- (4) Schedules time and travel for inspecting or monitoring dive operations and attends District sponsored diving meetings.
- (5) Recommends frequency of monitoring dives.
- (6) Maintains diving inspector certification.
- (7) Maintains CPR/First Aid.

f. Each Branch that may be involved in diving operations should have a qualified diving inspector. This will ensure a lesser impact of having to utilize diving inspectors from another Branch. Training requirements shall be adequately funded by the office sponsoring the dive inspector and documented in the appropriate individual development plans and the SOHO.

g. All costs associated with the utilization of District Diving personnel shall be the responsibility of the Project, which requires the diving operation.

h. In addition to the personnel described above, the Project Manager, Resident Engineer, Project Engineer, Construction Representative and Supervisor at each project or facility are charged with ensuring the efficiency and safety of the diving operations within their areas of responsibility. They have the authority to stop a dive operation for an unsafe condition but may not override a dive operation decision made by the assigned diving inspector.

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i. Prior to solicitation for diving services, the contracting office, technical manager and/or project manager will coordinate with the DDC to ensure all diving requirements are understood and incorporated in contract documents. Additionally, all correspondence sent outside of the District will be subject to review by the DDC or ADDC for technical accuracy.

APPENDIX R
QUALIFICATION, EXAMINATION, AND CERTIFICATION
OF
MOTORBOAT OPERATORS

1. Purpose. This Appendix establishes policy and procedures for the training, testing, and licensing of operators of District motorboats less than 26 feet in length.

2. Applicability. These requirements apply to all Wilmington District operators of motorboats less than 26 feet in length.

3. References.

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

b. ER 385-1-91, Training, Testing and Licensing of Small Boat Operators

4. Policy.

a. Technical Services Division will designate individuals as the responsible persons for administering all motorboat operators training. Those individuals will successfully complete the HQUSACE approved, 40-hour, Boat Operator's License Examiner Course as outlined in Annex I of this appendix. All instructors must successfully complete the approved 40-hour training course.

b. The SOHO shall be responsible for program administration, records management and licensing activities within the District. The Safety Office will also provide initial review of nominees for training to ensure medical compliance requirements are met.

c. All District elements will ensure that operators of motorboats are adequately trained, properly tested, and licensed prior to the official operation of any Government motorboat. Prior to completing a motorboat operator's course, unlicensed employees may practice boat operation under strict supervision of a licensed employee. Boat operation by unlicensed employees shall only be

used to gain experience prior to completing a HQUSACE Boat Operators Course.

4. Requirements.

a. Any person licensed to operate a motorboat shall be at least 18 years of age.

b. District employees operating motorboats or vessels subject to U.S. Coast Guard inspection and certification shall possess a valid U.S. Coast Guard license as specified on the Certificate of Inspection for the vessel being operated.

c. Motorboat operators shall have the full use of both hands, feet, and legs. Operators with red-green color blindness, or indication of night vision deficiency shall be limited to daytime operation only.

d. District operators of boats and vessels less than 26 feet in length shall successfully complete the 24-hour training requirement specified in Annex II of this Appendix. Operators requiring training under this regulation will retrain and successfully complete an eight-hour boat operator update course on a five-year cycle. Request for exceptions to this requirement must be submitted, through command channels to the HQUSACE Safety and Occupational Health Office for resolution.

e. District employees operating boats and vessels 26 feet or more in length but not subject to inspection and certification by the U.S. Coast Guard will possess a valid U.S. Coast Guard license appropriate for the size and type of vessel being operated, and the route that the vessel will operate. Since persons who are not Corps of Engineers employees often travel aboard District vessels, the U.S. Coast Guard license must be appropriate for carrying passengers.

f. District boat and vessel operators possessing a valid U.S. Coast Guard License must also obtain a small boat operators license by presenting a U.S. Coast Guard License and satisfactorily completing the boat handling skills portion of the boating course and the written examination.

g. Current District boat and vessel operators not possessing a U.S. Coast Guard License, who can pass the boat handling skills portion of the HQUSACE boating course and can satisfactorily complete the final written examination, may be exempt from the training requirements in Annex II of this Appendix. This demonstration of Skills and knowledge will be on a case by case basis and will include the standard written examination and actual demonstration of boat and trailer skills.

h. Rosters of training sessions will be forwarded to the Safety Office to verify training of boat operators. All completed examinations will be forwarded to the Safety Office and used to verify testing of motorboat operators. Optional Form 346, U.S. Government Operator's Identification Card will be issued, by the Safety Office, to individuals who satisfactorily complete the required training requirements and/or demonstrate the required proficiency in accordance with this regulation.

5. Job Requirement. For all positions requiring an employee to operate a boat or vessel as any part of the duties of that position, the Job Description and Vacancy Announcement or Recruiting Bulletin shall contain a statement specifying the type of license that the employee must possess.

6. Suspension of Revocation of License. Motorboat operator licenses may be suspended or permanently revoked for the following reasons:

- a. Reckless, negligent, or careless operation.
- b. Willful damage to a motorboat.
- c. Violation of U.S. Coast Guard "Rules of the Road" in a manner to endanger life and property.
- d. Operating a motorboat while under the influence of intoxicating beverages or drugs.
- e. Misconduct that warrants suspension of license.

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ANNEX I
U.S. ARMY CORPS OF ENGINEERS
BOAT OPERATOR LICENSE EXAMINER
TRAINING OUTLINE
(40 HOURS)

The following outline will be used in the HQUSACE approved training course to train, test, and license individuals as motorboat operator license examiners. Individuals must complete this course of instruction to be certified as a local license examiner.

DAY ONE

- * Welcome and Administration
- * USACE Boat Licensing Policy and Course Introduction
- * Boating Knowledge Pretest w/o Critique
- * Required Safety and Normal Equipment and Equipment Maintenance
- * Boat Orientation
 - (1) Starting Procedures
 - (2) Checking Equipment
 - (3) Getting Underway
 - (4) Refueling Procedures
- * Trailers and Trailer Maintenance
- * Marlinespike Seamanship
- * Navigation and Rules of the Road
- * Fire Suppression
- * Review and Critique

DAY TWO

- * Fire Suppression (Practical)
- * Course Familiarization (Classroom)
- * 100 Yard Swim Test with Life Jacket
- * Emergency Procedures (Practical)
 - (1) Reaching, Throwing
 - (2) Self Rescue, H.E.L.P., and Huddle
 - (3) Overboard Drill, Roll Aboard
- * Boat Operation, Course Familiarization (Practical)
- * Secure Operation and Critique

DAY THREE

- * Repetitive Boat Exercises (Practical)
 - (1) Serpentine Course
 - (2) Transition Serpentine
 - (3) Avoidance Course
 - (4) Docking
- * Repetitive Boat Exercises and Role Playing
- * Secure Operation and Critique

DAY FOUR

- * Concurrent Boat Exercises (Practical)
 - (1) Trailering
 - (2) Alongside Maneuvering
 - (3) Towing Vehicles
 - (4) Emergency Procedures
- * Concurrent boat Exercises and Role Playing
- * Secure Operations and Critique

DAY FIVE

- * Evaluation of Boating Skills (Practical)
- * Safety Manual (EM 385-1-1) Review
- * Review/Post Test/Critique/Course Closure

ANNEX II
U.S. ARMY CORPS OF ENGINEERS
BOAT OPERATORS TRAINING COURSE
(24 HOURS)

The following outline will be used to train employee operations of boats and vessel less than 26 feet in length. It is not necessary for the course days to run consecutively. The course schedule can be altered to meet local requirements as long as the subjects listed below are included in the total curriculum.

DAY ONE

- * Welcome and Purpose of Course
- * Written Boating Knowledge Pretest
- * Required boating Safety Equipment and EM 385-1-1 Requirements
- * Boats/Trailers/Maintenance
- * Navigation and Rules of the Road
- * Demonstration of Emergency Procedures

DAY TWO

- * Fire Suppression (Practical)
- * Boat Orientation (Practical)
 - (1) Equipment Check
 - (2) Starting Procedures
 - (3) Getting Underway
- * Practical Boating Skills (Practical)
 - (1) Refueling Procedures
 - (2) Equipment Maintenance
 - (3) Marlinespike Seamanship
 - (4) Mooring and Tying Off
- * Course Familiarization w/Instructor (Practical)
 - (1) Boat Handling Familiarization
 - (2) Docking Course
 - (3) Serpentine Course
 - (4) Transition Serpentine Course
 - (5) Obstacle Avoidance Course
- * Boating Course w/o Instructor (Same as Above)

DAY THREE

- * Boat Exercises
 - (1) Trailer, Backing, Launching, and Retrieving
 - (2) Alongside Maneuvering
 - (3) Towing of Vessels
 - (4) Emergency Procedures
- * Evaluation of Boating Skills
 - (1) Docking Course
 - (2) Serpentine Course
 - (3) Transition Serpentine Course
 - (4) Obstacle Avoidance Course
- * Post Test/Review/Critique

APPENDIX S
COLD WEATHER BOATING

1. Purpose. The purpose of this Appendix is to establish policy, responsibilities and procedures for solo cold weather boating.

2. Applicability. This Appendix is applicable to all government and contract personnel that are required to perform solo cold weather boating activities for the Wilmington District.

3. Policy. It is the policy of the Wilmington District that all cold water boating activities be conducted in a manner that will minimize the potential for personal injury, or loss of life resulting from the effects of hypothermia.

4. General. Cold weather boating exposes all participants to the effects of hypothermia. Hypothermia is the lowering of the body's core temperature. It is caused by exposure to cold, and aggravated by wet, wind, and exhaustion. It is most common in cold temperatures, but it can occur in some people when it is as warm as 70°. Most hypothermia cases develop in air temperatures between 30 and 50 degrees. Loss of body heat due to exposure to cold can lead to boating accidents and immersion in water. Immersion results in loss of body heat to the water, which is a major cause of deaths in boating accidents. Survival time for a boater immersed in 60° water is approximately 90 minutes.

5. Responsibilities. All solo boaters should follow the procedures outlined in paragraph 6 below. Additionally, it is recommended that the procedures outlined below be applied to all cold weather boating.

6. Procedures. When exposed to wind, cold or wetness, precautions should be taken to avoid the risks associated with hypothermia. Boaters should avoid exposure by staying dry, being aware of the wind, and understanding the cold. Boaters that cannot stay dry and warm should return to shore as quickly and safely as possible, keeping in mind that wind chill associated with high speeds across the water aggravates hypothermia. Boaters should never ignore shivering as this is a sign of the onset of hypothermia. When boating during cold weather the following procedures should be followed:

a. Boaters shall always wear a PFD and clothing that is appropriate for immersion in water (do not wear cotton). Solo boaters in remote areas should consider wearing an immersion suit when the water temperature is below 60° and the air temperature is below 45°. Solo boaters shall also wear a water-activated PFD distress light and hailing whistle.

b. Boaters to remote areas shall advise designated personnel of their destination and when they can be expected to return.

c. Boaters to remote areas shall maintain radio or cellular phone contact with designated personnel.

APPENDIX T
BLOODBORNE PATHOGENS PROGRAM

1. Purpose. The purpose of this Appendix is to establish a formal Bloodborne Pathogen Program to educate and protect District employees with the reasonable potential for occupational exposure to Hepatitis B Virus (HBV) and Human Immunodeficiency Virus (HIV).
2. Applicability. This Appendix is applicable to all Wilmington District and contract personnel who fulfill duties of Park Rangers, Lock and Dam Maintenance Mechanics, and employees designated as first-aid responders.
3. References.
 - a. EM 385-1-1, US Army Corps of Engineers Safety and Health Requirements Manual
 - b. 29 CFR 1910.1030, Bloodborne Pathogens
 - c. 5 U.S.C. 7901
4. DEFINITIONS.
 - a. **Occupational Exposure** means reasonably anticipated skin, eye, mucous membrane or parenteral contact with human body fluids or contaminated material.
 - b. **Contaminated** means the presence or reasonably anticipated presence of bloody fluids or infectious materials.
 - c. **Decontamination** means the removal or destruction of pathogens by physical or chemical means rendering them no longer infectious.
 - d. **Bloodborne Pathogens** means pathogenic microorganisms that are present in human blood that can cause disease in humans.
 - e. **Infectious body fluids** includes semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid and amniotic fluid.

f. **Parenteral** means piercing of the skin barrier or mucous membranes through such events as needlesticks, human bites, cuts and abrasions.

g. **Exposure Incident** means a specific eye, mouth, other mucous membrane, non-intact skin or parenteral contact with blood or other potentially infectious materials that result from the performance of an employee's duties.

h. **Engineering Controls** means physical containers that isolate or remove the bloodborne pathogens hazard from the workplace.

i. **Universal Precautions** means to treat all human blood and body fluids as though they are infectious.

j. **Source Individual** is any person, living or dead with whom an employee had body fluid contact.

5. Employee Classification.

a. Supervisors will complete the enclosed form, SAW Form 656 (Annex II), for each employee (old and new hires) and forward the completed form to the SOHO. These forms will be completed in triplicate. The original will go to the SOHO, one copy will be kept in the supervisors' files and one copy will be given to the employee.

b. The SOHO will compile a list of employees who are classified as Category I and II (See SAW Form 656 for the Categories). These employees will be entered into the Bloodborne Pathogens Program.

c. The original copy of the SAW Form will be filed in the employee personnel records by the Civilian Personnel Advisory Center.

6. Training of Category I and II.

a. All Category I and II employees will receive training at the time of initial assignment and annually thereafter.

b. Training, as a minimum, will include all elements of 29 CFR 1910.1030.

7. Control Precautions.

a. Body fluids that may be infectious include semen, blood, vaginal secretions, cerebrospinal fluid, spinal fluid, amniotic fluid, peritoneal and pericardial fluid. The following precautions will be practiced by all employees in Category I or II:

(1) Universal precautions shall be practiced for all body fluids. This includes the use of personal protection equipment when handling any body fluid and disposing of contaminated materials in red bags or containers.

(2) Puncture proof containers will be provided by the Safety Office and used where it is necessary for employees to take their own hypodermic injections during working hours.

(3) Employees will be provided with personal protective equipment to include mouth shield, bio-hazard bags, and other equipment that may be required.

(4) Hepatitis B vaccine will be offered to all Category I and II employees. An employee who elects not to take the vaccine at initial training may elect to do so at any time throughout employment. There is no cost to the employee for the vaccine of its administration regardless of when it is given.

(5) Any exposure to body fluids including splashes to mucous membranes, needlesticks or mouth-to-mouth resuscitation will be reported to the Safety Office by the supervisor or the exposed employee immediately and the procedure for exposure initiated.

8. Decontamination.

a. Contaminated hands and skin surfaces will be washed immediately if soiled with body fluids.

b. Employees will remove clothing soiled with body fluids. The contaminated clothing will then be placed in a plastic leak proof bag and laundered in the washing machine using regular laundry soap.

c. If body fluids are spilled on tabletops, floors or other surfaces, they should be wiped up with rags or towels (while wearing gloves) and the area mopped with a solution of 1:10 bleach water.

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d. Equipment should be wiped or soaked in 1:10 bleach water if the equipment is not disposable, and if disposable it should be placed in leak proof bags and disposed of as medical waste.

9. Post Exposure Protocol.

a. All exposures to body fluids, regardless of category of employee will be reported immediately to the supervisor and to the Safety Office. Both reports will include names of all persons involved, dates, time and description of the incident. A determination by the exposed employees must be included as to whether an occupational exposure was experienced by each of the participants.

b. A confidential medical evaluation will be made immediately. The physician providing the evaluation will be provided with:

(1) A copy of 29 CFR 1910.1030.

(2) Identification and documentation of the source, unless it is infeasible by state or local law.

(3) Route and circumstances of exposure.

(4) Status of the employee's HBV vaccination.

(5) A copy of the employee's job description.

c. The source individual's blood will be tested as soon as feasible after consent is obtained by the employee in charge on site to determine HBV and HIV infectivity. If consent cannot be obtained, written documentation of this shall be made and forwarded to the Safety Office.

d. If the source individual is known positive for HIV or HBV further testing is not necessary.

e. The employee shall be informed of applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual. After which the SOHO will make the results of the source individuals testing available to the employee.

f. The SOHO shall request from the health care professional and provide to the exposed employee within 15 days from the medical evaluation information on the status of the vaccination and the health care professional's opinion on additional medical care.

g. All findings and information on the employee evaluation shall be confidential.

h. A record of all such incidents will be maintained in the SOHO.

10. Hepatitis B Vaccine.

a. After training has been accomplished, hepatitis B vaccine will be made available to all employees in Category I or II within 10 working days after assignment to tasks with potential for occupational exposure. The vaccine is not required if the employee has previously received the vaccination series or the vaccine is contraindicated, or the employee is immune.

b. All Category I and II employees will sign SAW Form 655 (Annex I) either accepting or declining the administration of hepatitis B vaccine.

c. Pre-screening will not be a prerequisite for receiving Hepatitis B vaccine.

11. Recordkeeping.

a. Supervisors will maintain a list of all employees classified as Category I or II.

b. The SOHO will maintain records of:

(1) All Category I and II employees will be maintained on SAW Form 656.

(2) All training with the date, employee name, social security number and signature, the name of the person presenting the training and the content of the training. Training records will be kept for three years from the date of training.

(3) The health care provider shall maintain vaccination records of Category I and II employees.

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(4) Declination forms signed by personnel who, although performing category I or II duties, have chosen not to receive Hepatitis B vaccine.

(5) All medical information relating to post exposure evaluations which will be maintained for at least the duration of employment plus thirty years.

12. Responsibilities.

a. Supervisors will ensure that their employees are classified and attend the required training.

b. The SOHO will provide a source for training and a source for the vaccine.

c. Each employee should practice universal precautions and immediately report any exposure.

13. Labels and Signs.

a. Red bags will serve as labeling for contaminated waste.

b. All specimens will be placed in bags marked **BIOHAZARD MATERIAL.**

c. The red sharps containers are self-labeled.

d. Contaminated clothing will be placed in red bags and marked as clothing until they can be washed.

ANNEX II
CLASSIFICATION OF EMPLOYEES AT RISK FOR HBV AND HIV

U.S. Army Corps of Engineers, Wilmington District

Employee Name _____
Job Title _____
Location _____
Category _____

Employees will be placed in one of three categories determined by the duties they perform in their normal daily work. The following is a description of each category and the criteria used to establish the category for each employee in the program.

1. Category I - The employee performs tasks that involve an inherent potential for mucous membrane or skin contact with blood, body fluids, or tissue or a potential for spills or splashed. Universal precautions should be applied for all procedures when it is likely that the employee will have contact with blood or body fluids, to prevent transmission of bloodborne pathogens. Hepatitis B Vaccine is highly recommended for these employees.

2. Category II - The employee performs tasks that involve no exposure to blood, body fluids or tissue during the normal working routine, but the employee may be required to perform unplanned category I duties. Universal precautions should be used to perform any Category I procedures. Hepatitis B vaccine is recommended for these employees.

3. Category III - the employee performs duties that involve no exposure to blood, body fluids or tissue during the normal work routine. No special precautions are necessary to prevent transmission of bloodborne pathogens.

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ACCEPTANCE/DECLINATION
(29 CFR 1910.1030)

ACCEPTANCE

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. I wish to receive the Hepatitis B vaccine.

Employee's Name
(Print) _____
Employee's
Signature _____ Date _____
Supervisor's Name
(Print) _____
Supervisor's
Signature _____ Date _____

DECLINATION

I understand that due to my occupational exposure to blood and other potential infectious materials I may be at risk of acquiring hepatitis B virus (HBV). I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Employee's Name
(Print) _____
Employee's
Signature _____ Date _____
Supervisor's Name
(Print) _____
Supervisor's
Signature _____ Date _____

HEPATITIS B VACCINE INFORMATION

1. Hepatitis B Virus is a viral infection caused by the hepatitis B virus (HBV) which causes death in 1-2% of patients. Most people with Hepatitis B recover completely, but approximately 5-10% becomes a chronic carrier of the virus. Most of the people have no symptoms, but continue to transmit the disease to others. Some may develop chronic active hepatitis and cirrhosis. HBV also appears to be a causative factor in the development of liver cancer. Thus, immunization against Hepatitis B can prevent acute hepatitis and also reduce sickness and death from chronic hepatitis, cirrhosis and liver cancer.

2. The Hepatitis B vaccine is a recombinant vaccine derived from yeast cells. A high percentage of healthy people who receive three doses of vaccine achieve protection against hepatitis B infection. Full immunization requires 3 doses of vaccine over a six-month period, although some people may not develop immunity even after 3 doses. The vaccine is given in the upper arm in the deltoid muscle. There is no evidence that the vaccine has ever caused hepatitis B or AIDS. However, persons who may have been infected with HBV prior to receiving the vaccine may develop clinical hepatitis in spite of immunization. The duration of immunity is unknown at this time, but is probably long-term.

3. Persons who have a known hypersensitivity to yeast **should not** receive the vaccine. Another type of vaccine will be made available for those personnel. The vaccine is also **not** recommended for pregnant women and nursing mothers.

4. Very few adverse reactions have been recorded. The most typical reported reactions are local site soreness, swelling and tenderness. Some other reactions reported are nausea, vomiting, abdominal pains and cramps, headache, light-headed, fatigue and weakness. There have been no reported deaths associated with this vaccine.

APPENDIX U
CONFINED SPACE ENTRY PROGRAM

1. Purpose. The purpose of this Appendix is to set forth practices and procedures required for safe entry into permit-required confined spaces.

2. Applicability. This Appendix applies to all government and contractor activities within the Wilmington District.

3. References.

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

b. 29 CFR 1910.146, Permit-Required Confined Spaces

c. DHHS (NIOSH) PUBLICATION NO. 87-113; "A Guide to Safety in Confined Spaces".

d. Control of Gas Hazards Aboard Vessels, ANSI-NFPA 306.

e. Criteria for a Recommended Standard, Working in Confined Spaces, National Institute of Occupational Safety and Health (NIOSH), (1979).

4. General.

a. A confined space is a space that meets the following requirements:

(1) Is large enough and so configured that an employee can bodily enter and perform assigned work.

(2) Has limited or restricted means of entry and exit.

(3) Is not designed for continuous human occupancy.

b. A non-permit confined space is a confined space that does not contain or with respect to atmospheric hazards, the potential to contain any hazard capable of causing death or serious physical harm.

c. A permit-required confined space is a confined space that has one or more of the following characteristics:

(1) Contains or has the potential to contain a hazardous atmosphere.

(2) Contains a material that has the potential to engulf an entrant.

(3) Has an internal configuration that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a small cross-section.

(4) Contains any other recognized serious safety or health hazards.

d. Each facility or activity shall designate a competent person to manage and evaluate the facilities Confined Space Entry Program.

e. Each facility or activity shall maintain, on site, a Confined Space Entry Plan. The Plan shall comply with the requirements of EM 385-1-1 and 29 CFR 1910.146. The Plan shall contain the following information:

(1) All pertinent definitions contained in 1910.146 and EM 385-1-1.

(2) Training requirements.

(3) Responsibilities of authorized entrants, attendants and entry supervisors.

(4) Permit-required and non-permit entry procedures and site specific entry permits.

(5) Recommended personal protective equipment, retrieval and communication systems.

f. All permit-required confined spaces shall be identified with a sign reading "DANGER - PERMIT-REQUIRED CONFINED SPACE - DO NOT ENTER" to inform personnel of the existence and location of, and the danger posed by the permit-required confined space.

g. Facilities shall be re-evaluated at least once every three years.

5. Training.

a. All employees shall be instructed not to enter permit-required confined spaces without the proper permit outlining procedures and practices for the space.

b. Employees who are required to enter permit-required confined spaces or act as attendants or entry supervisor shall be trained in order to acquire the knowledge and skills necessary for the safe performance of their work. The employees must also be familiar with the types of hazards associated with the entry and the control measures used to ensure safe conditions.

c. Training shall conform to requirements of reference 3a and 3b.

d. The instructor upon successful completion of participants shall certify all training.

6. On Site Rescue Teams.

a. Each member of the rescue team shall be trained in the use of personal protective equipment and equipment necessary to perform a rescue.

b. Each member of the rescue team shall practice making a rescue at least once every twelve months. The practice drill shall simulate actual conditions within the permit-required confined space.

c. Each member of the rescue team shall receive the same level of training as authorized entrants and shall be trained in basic first aid and cardiopulmonary resuscitation (CPR).

7. Off Site Rescue.

a. The rescue service shall be informed of the associated hazards they may confront during a rescue.

b. The rescue service shall be provided access to all permit-required confined spaces for which rescue may be necessary so the service can develop appropriate plans.

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8. Retrieval Systems. Retrieval systems shall be as recommended in each facility's Confined Space Entry Plan.

9. Recordkeeping. Records shall be maintained at each facility by the facility manager documenting training, including safety drills, inspections, tests and maintenance, and any atmospheric tests made to include time, date, PEL concentrations, PPE used, employees' names, etc.

ANNEX I
ACTIVITY HAZARD ANALYSIS-CONFINED SPACE ENTRY

Listed below are some potential hazards associated with entering a confined space and the possible means of controlling those hazards. The list may not be all-inclusive. Specific activity hazard analyses (AHA) shall be prepared for the hazards anticipated in each confined space that is entered. SAW Form 652 shall be used for preparing AHAs.

1. HAZARD: Toxicity

Causes: - Toxic levels of substances in a confined space (CS).
 - Decomposition of organic material in the CS.
 - Mixture of substances in the CS.
 - Substances being used in the CS (e.g. cleaning solvents).
 - Residual vapors from previous contents of CS.
 - Welding fumes or vapors.

Controls: - Evaluate previous history of the CS to avoid reactions with residual chemicals, wall scale, and/or sludge that can be highly reactive.
 - Check for compatibility of materials when structural members and/or equipment are introduced (e.g. aluminum ladder, cleaning solvents).
 - Utilize proper respiratory equipment based on air monitoring.

2. HAZARD: Insufficient oxygen.

Causes: - Rust.
 - Use of other gases (e.g. nitrogen, carbon dioxide, etc).
 - Welding.

Controls: - Maintain atmospheric oxygen level of 21% by volume by providing thorough ventilation and exhaust as per conditions in the CS.

- Self-contained breathing apparatus.

3. HAZARD: Explosion or Fire in the CS

Causes: - Combination of combustible gases in the CS and a spark from an activity of an employee in the CS (dip-testing tank, welding, electric tools, light bulbs, matches).

Controls: - Use non-sparking tools (NFPA).
- No matches, lighters or other flame producing sources allowed in CS.
- Explosion proof bulbs.
- Provide adequate ventilation to prevent an oxygen enriched atmosphere.

4. HAZARD: Explosion or Fire at Point of Entry

Causes: - Employee welding, using power tool or other spark generating activity at point of entry.
- Driving automobile near CS containing combustible materials.

Controls: - Use of non-sparking tools.
- Barricade entry point within reasonable distance.
- Prohibit vehicles within immediate area.

5. HAZARD: Electrocution/Electric Shock

Cause: - Conductive walls of CS picking up an electrically "hot" source in the CS.

Control: - Ensure that all electrical apparatus used comply with Standards.
- Lockout electrical sources.

6. HAZARD: Caught In/Crushing

Cause: - Entering machine/area that has not been locked out, having it activated.

Control: - Manually isolating each piece of equipment before workers enter or while they work in a CS. Follow specific procedures for mechanical lockout.

7. HAZARD: Struck by falling objects in CS.

Causes: - Falling objects from walls of CS.
- Objects falling through point of entry.

Controls: - Barricade entry of CS.
- Wear appropriate personal protective equipment (e.g. hardhat).
- Assess hazards prior to entry.

8. HAZARD: Falls While in CS.

Causes: - Wet, oily floors, configuration of internal surfaces.
- Holes/breaking through part of CS.
- Falls over objects and tools.
- Poor lighting.
- Uneven surfaces.

Controls: - Ensure floor and base are clean and dry.
- Wear proper foot protection.
- Locate, identify, and barricade existing holes.
- Provide adequate illumination.
- Practice good work habits (housekeeping).
- Use guardrails and scaffolding properly.

9. HAZARD: Bodily Reactions, Strains, and Abrasions.

Causes: - Entering, leaving cramped sharp-edged, high-level or hazardous point of entry into a CS.
- Maneuvering within a CS.
- Low head room (striking head).

Controls: - Wear personal protective equipment.
- Training to ensure awareness.
- Reduce bulkiness of clothing, equipment, etc.
- Engineer controls to eliminate condition.

10. HAZARD: Eye Injuries.

Causes: - Falling dust.
- Grinding, chipping, other operations that cause flying debris.

Control: - Wear proper eye protection at all times.

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11. HAZARD: Contact With Temperature Extremes.

Causes: - Steam discharge.
 - Welding surfaces.
 - Weather conditions.
 - Compressed gases (e.g. nitrogen).

Controls: - Wear appropriate clothing, PPE.
 - Limit time of exposure.
 - Know symptoms of excessive exposure.
 - Frequent breaks to ensure high fluid intake to
 compensate for hot climates and for hot conditions
 inside PPE.

APPENDIX V
HAZARD COMMUNICATION PROGRAM

1. Purpose. The purpose of this Appendix is to establish a Hazard Communication Program and to inform and educate District personnel on the occupational health hazards associated with the chemicals in their workplace.
2. Applicability. This Appendix is applicable to all Wilmington District personnel and to all contractors conducting business with the Wilmington District.
3. References.
 - a. 29 CFR 1910.1200, Hazard Communication
 - b. 29 CFR 1926.59, Hazard Communication
4. General. The District's Hazard Communication Program has been developed in accordance with 29 CFR 1910.1200 to ensure that all chemical substances that are brought into the workplace have been evaluated for their physical and health hazards and that information concerning these hazards is transmitted to those employees with potential for exposure. Only those chemicals that have been classified as a health or physical hazard in accordance with 29 CFR 1910.1200 are required to be included in the Hazard Communication Program. Consult with the SOHO if there is an uncertainty as to a chemical's inclusion.
5. Major Elements. There are five major elements of the District's Hazard Communication Program; Chemical Assessment and Inventory; Hazardous Chemicals Labeling System; Material Safety Data Sheets (MSDS); and Employee Training. All elements are covered in the document titled Hazard Communication Program for the Wilmington District.

APPENDIX W
PUBLIC SAFETY

1. Purpose. This Appendix establishes a coordinated safety program for the purpose of preventing public accidents.
2. Applicability. This Appendix applies to all Wilmington District elements involved with public recreation activities.
3. References.
 - a. AR 385-10, The Army Safety Program
 - b. EM 385-1-1, US Army Corps of Engineers Safety and Health Requirements Manual
 - c. EM 1110-1-400, Recreation Planning and Design Criteria
 - d. EM 1110-2-410, Design of Recreation Areas and Facilities - Access and Circulation
 - e. ER 1110-2-400, Design of Recreation Sites, Areas and Facilities
 - f. ER 1130-2-550, Recreation Operations and Maintenance Policies
 - g. EP 310-1-6, Sign Standards Manual
 - h. 36 CFR 327, Rules and Regulations Governing Public Use of Resource Development Projects Administered by the Chief of Engineers
4. Policy. The Wilmington District has a responsibility for the safety of the visiting public who use District facilities for recreational activities. In order to meet this responsibility, District facilities must be planned, designed, constructed, operated, and maintained in a manner that will best provide safety for the user.
5. Responsibility. A successful safety program requires a coordinated effort from all concerned District elements.

Operations branch is the basic element responsible for operation, maintenance, and management of the District's water resource projects. They must have the primary responsibility for the implementation of the public safety program. Supporting elements include the Safety Office, Planning, Engineering, Office of Counsel, Public Affairs and Real Estate. Responsibilities of the elements are listed below:

a. Operations Branch.

(1) Develop and update as required public and employee safety action plans that will address employee, public and water safety.

(2) Promote safety awareness for the public and Operations employees to prevent and reduce accidents at water resource projects.

(3) Ensure that employees responsible for public safety are well trained and have sufficient knowledge to perform their duties with confidence.

(4) Improve safety programs at water resource projects through enhanced interagency cooperation.

(5) Ensure compliance with all current regulations involving safe design, construction, and operation of public use areas; employee work practice; safety equipment; and safety training.

(6) Provide the visiting public with a safe recreational experience.

(7) Project signs shall be in accordance with the Sign Standards Manual, EP 310-1-6.

b. Safety and Occupational Health Office.

(1) Assists District elements in organizing, directing, and monitoring the effectiveness of the public safety program.

(2) Ensures that District elements are abreast of the latest developments in public safety.

(3) Assists Operations personnel with the performance of compliance inspections.

(4) Performs safety surveys of public use areas.

(5) Reviews plans and specifications for the development of public use areas to ensure compliance with safety standards.

(6) Assists with the development, procurement, and distribution of water safety program promotional material.

(7) Maintains records of public drowning and injuries.

C. Planning Branch. Plan and develop recreation facilities in such a manner as to reduce the drowning potential of the user. Items to be considered are:

(1) Ensure that recreation sites, including swimming beaches are developed in areas with safe shorelines. Shorelines should not have dangerous submerged drop-offs, boulders, and strong currents.

(2) Plan for boat launch facilities with safe boarding access and vehicular access that would eliminate the public from accidentally driving head-on into the water.

(3) Ensure that all planning and design is in accordance with EM 1110-1-400.

d. Engineering Branch.

(1) Design recreation facilities to reduce the drowning potential.

(2) Provide safe shorelines in public use areas where swimming and wading are likely to occur by eliminating submerged physical hazards.

(3) Design swimming beaches as required by ER 1110-2-400, EM 1110-1-400.

(4) Review marina concessionaire development plans and design specification to ensure compliance with current criteria.

(5) Design boat launch facilities to provide safe boarding access.

(6) Ensure launch ramps are laid out in a manner that reduces the potential of visitors from accidentally driving into the water.

(7) Provide safe vehicular access along shoreline roads to prevent accidental entry into the water.

e. Office of Counsel.

(1) Provide legal research for determining liability due to drowning and other injuries.

(2) Review wording of signs and other written instructions and materials for adequacy.

(3) Review marina concessionaire contracts to ensure that safety provisions are included and are enforceable.

f. Public Affairs Office.

(1) Inform employees, the general public, media, civic organizations, and industry of our safety program and our accomplishments in the safety arena.

(2) Develop radio and television public safety announcements for our projects.

(3) Develop water safety handouts to be given to the public.

g. Real Estate.

(1) Prepare marina concessionaire contracts in a manner that will require the concessionaire to abide by all current 385 series safety standards, NFPA, and environmental laws.

(2) Ensure that implementation of safety provisions is checked during compliance inspections.

APPENDIX X
CONTROL OF HAZARDOUS ENERGY
(LOCKOUT/TAGOUT)

1. Purpose. This Appendix establishes requirements and procedures for the control of hazardous energy (Lockout/Tagout) for the purpose of disabling machines and equipment to prevent the unexpected energizing, start-up, or release of stored energy.
2. Applicability. This Appendix applies to the control of energy during servicing and maintenance of equipment by government and contractor personnel within the Wilmington District.
3. References.
 - a. ER 385-1-31, The Control of Hazardous Energy (Safe Clearance)
 - b. EM 385-1-1, US Army Corps of Engineers Safety and Health Requirements Manual
 - c. 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout)
4. Definitions.
 - a. Energy Isolating Device. A mechanical device that physically prevents the transmission or release of energy.
 - b. Energy Source. Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.
 - c. Lockout. The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.
 - d. Lockout Device. A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in a safe positions and prevent the energizing of equipment. Included are blank flanges and bolt slip blinds.

e. Tagout. The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

f. Tagout Device. A prominent warning device, such as a tag and a means of attachment, that can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and equipment being controlled may not be operated until the tagout device is removed.

g. Zero Energy State. Before any piece of equipment can be serviced or worked on in any way, it must be in a "zero energy state." This means no energy is coming into or is inside the equipment. Equipment that is just turned off is not at a zero energy state because it could easily be turned on again. Isolating the energy source and using locks and tags ensures the equipment reaches and stays at a zero energy state.

5. General. Each facility shall have a written lockout/tagout plan.

a. Lockout/Tagout.

(1) If an energy isolating device is not capable of being locked out, the energy control plan shall utilize a tagout system.

(2) If an energy isolating device is capable of being locked out, the energy control plan shall utilize lockout, unless it can be demonstrated that the use of a tagout system will provide a level of safety equivalent to that obtained by using a lockout system.

(3) After January 2, 1990, whenever replacement or major repair, renovation or modification of equipment is performed, and whenever, new equipment is installed, energy isolating devices for such equipment shall be designed to accept a lockout device.

b. Equipment may be powered by different types and combinations of energy sources:

(1) Electrical energy is the flow of currents through wires and circuits.

(2) Hydraulic energy is any type of liquid, including water, under pressure.

(3) Pneumatic energy is gas, including air, under pressure.

(4) Mechanical energy is potential or "built-up" energy, such as spring energy, that may cause equipment parts to move without warning.

c. Each facility shall have written lockout/tagout procedures which clearly and specifically outline the scope, purpose, authorization, rules, steps and techniques to be utilized for the control of hazardous energy and means to enforce compliance with these procedures. An example listing of steps is enclosed at Annex I of this Appendix for reference.

d. Authorized employees shall demonstrate energy control is in effect prior to any maintenance or service being conducted and submit a request for safe clearance using ENG Form 1927-R. A copy of this form is enclosed at Annex II of this appendix.

e. Each facility shall maintain a safe clearance log. All safe clearances will be entered into the log when issued and when released.

f. Protective materials and hardware.

(1) Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware used for controlling energy shall be provided for isolating, securing or blocking of equipment from energy sources.

(2) Lockout and tagout devices shall be singularly identified; shall be the only devices used for controlling energy; shall not be used for other purposes; and shall meet the following requirements:

(a) Lockout and tagout devices shall be capable of withstanding the environment in which they are exposed for the maximum period of time that exposure is expected.

(b) Tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.

(c) Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkaline chemicals are handled and stored.

(3) Lockout and tagout devices shall be standardized with the facility in at least one of the following criteria: color, shape, or size; and additionally, in the case of tagout devices, print and format.

(4) Substantial.

(a) Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

(b) Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal.

(5) Identifiable.

(a) Lockout and tagout devices shall indicate the identity of the employee applying the device.

(b) Tagout devices shall warn against the hazardous condition if machine or equipment is energized and shall include a legend such as the following: **Do Not Start, Do Not Open, Do Not Close, Do Not Energize, Do Not Operate.**

(c) No lockout or tagout device shall be removed by anyone other than the individual that placed the device.

(6) Inspections.

(a) A qualified individual shall conduct a periodic inspection of the energy control procedures at least annually to ensure that established procedures and requirements are being followed.

(b) Periodic inspections shall be performed by an authorized person other than the one utilizing the energy control procedures being inspected.

(c) Periodic inspections shall be conducted to correct any deviation or inadequacies identified.

(d) Periodic inspections shall include a review between the inspector and each authorized and those affected employees regarding the procedures and responsibilities being used.

(e) Periodic inspections will be documented for each piece of machinery or equipment. This certification shall identify the machine or equipment on which the energy control procedure was being used, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

6. Responsibility.

a. Supervisors.

(1) Will establish a program and utilize procedures for appropriate control of hazardous energy (lockout/tagout) for their facility.

(2) Will ensure that all necessary personnel receive required training regarding the control of hazardous energy.

b. Safety and Occupational Health Office. Will ensure that all programs involving the control of hazardous energy (lockout/tagout) are in compliance with district, and federal regulations.

7. Training. Training shall be provided for each affected employee to ensure that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired. Training shall include the following:

a. All authorized employees will receive initial and annual training in the recognition of applicable hazardous energy sources, the types and magnitude of the energy present in the workplace, and the methods and means necessary for energy isolation and control.

b. All affected employees shall be instructed in the purpose and use of the energy control procedures.

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c. All other employees whose work operations are or may be in an area where energy control procedures may be used shall be instructed about the procedure and about the prohibition relating to attempts to restart or re-energize machines or equipment that are locked out or tagged out. This training may be accomplished during regularly scheduled safety meetings.

d. **Lockout or tagout shall be performed only by the authorized employee who are performing the servicing or maintenance.**

e. Training will be documented. Certification shall contain each employee's name, dates of training, name of person(s) conducting the training, where the training was performed, and the subjects covered.

8. Personal Protective Equipment. All appropriate personnel protective equipment will be used when applying lockout and tagout procedures.

ANNEX I
CONTROL OF HAZARDOUS ENERGY
LOCKOUT/TAGOUT PROCEDURES
STEPS TO SAFETY

1. **TRACING THE ENERGY** - The energy sources powering the machine or equipment needing work must be located. A floor plan can help the authorized employee trace the flow of energy to its sources.
2. **SHUTTING DOWN EQUIPMENT** - The on/off switch, starter button, or local disconnect is turned to "off" to shut equipment down. There may be more than one point of shutdown therefore all of them must be turned off.
3. **ISOLATING THE ENERGY SOURCE** - Isolation devices are applied to all energy sources to block energy from coming into, moving within, or causing unexpected movement of equipment parts.
4. **LOCKOUT/TAGOUT** - A lock and tag (or a tag by itself) are attached to the isolation device and at other locations if required. The authorized employee may give the locks and tags a quick tug to make sure they are securely attached.
5. **RELEASING STORED ENERGY** - Equipment may contain stored or residual energy that could cause harm if released unexpectedly. To make the equipment safe, stored energy is either released or blocked.
6. **TESTING FOR ZERO ENERGY** - To make sure there is zero energy, the authorized employee tries to turn the equipment on. If it comes on, steps 1 through 5 are repeated. If the equipment does not start up, the employee can work safely.
7. **REMOVING LOCKS AND TAGS** - When the work is done locks and tags are removed by the authorized employee (or by the supervisor, under special circumstances). Afterward, the equipment may be restarted so that normal operations can resume.

Industrial accidents can result in serious injury and even death to you or nearby workers. You can help prevent accidents by working safely and following all lockout/tagout procedures. Never take short cuts to bypass the lockout, and never remove someone else's lock or tag unless established procedures are followed.

APPENDIX Y
Testing and Inspection of Permanently
Installed Overhead and Gantry Cranes

1. Policy and Scope.

a. To set forth the District Policy regarding the testing and inspection of permanently installed overhead and gantry cranes at Corps of Engineers owned installations wherever they may be located within the District.

b. Such installations include, but are not limited to, powerhouses and pumping stations.

2. References.

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

b. ANSI Standard 8 30.2--1990, "Overhead and Gantry Cranes."

3. Testing.

a. Prior to initial use, all new, reinstalled, altered, extensively repaired, or modified cranes shall be tested by a qualified person to insure compliance with references 2a and 2b.

b. This test shall include the following functions:

(1) Lifting and lowering.

(2) Trolley travel.

(3) Bridge travel.

(4) Limit switches.

(5) Locking, limiting, safety and indicating devices, if provided.

c. The trip setting of hoist limit devices shall be determined by tests with an empty hook traveling in increasing speeds up to the maximum speed. The actuating mechanism of the upper limit device shall be located so that it will trip the device under all

conditions, in sufficient time to prevent contact of the hook or load block with any part of the trolley or crane.

d. In addition to the above described operational tests and prior to initial use, all new, reinstalled, extensively repaired, modified, and altered cranes shall be tested and inspected by or under the direction of a designated or authorized person. The person performing the test and inspection shall furnish a written report confirming the load rating of the crane. The load rating should not be more than 80% of the maximum load sustained during the test. Test loads shall not be more than 125% of the rated load, unless otherwise recommended by the manufacturer. The test reports shall be placed on file where readily available to appointed personnel. The rated load test, if made, shall consist of the following operations as a minimum requirement.

(1) Hoist the test load a distance to assure that the load is supported by the crane and held by the hoist brake(s)

(2) Transport the test load by means of the trolley for the full length of the bridge.

(3) Transport the test load by means of the bridge for the full length of the runway in one direction with the trolley as close to the extreme right hand end of the crane as practical. And in the other direction with the trolley as close to the extreme left hand end of the crane as practical.

(4) Lower the test load, and stop and hold the load with the brake(s).

e. Load capacity so established shall be entered on ENG Form 3364, as set forth in paragraph 18.C.02, and a copy of this form furnished to District Safety Office.

4. Inspections. A competent person, using the checklist contained in Annex I of this Appendix, shall make annual inspections of such hoisting machinery. The original of this annual inspection shall be maintained in the files at the installation with a copy furnished District Safety Office.

Annex 1
ANNUAL INSPECTION OF OVERHEAD CRANES PERMANENTLY INSTALLED IN
POWERHOUSES AND PUMPING STATIONS AND OTHER INSTALLATIONS
IN THE WILMINGTON DISTRICT

1. Is it clearly legible from the ground or floor?
2. If there is more than one hoisting unit, does each hoist, or its load block, have the rated load marked on it in such fashion that it is clearly legible from the ground or floor?
3. Where passageways or walkways are provided on the structure supporting the crane, are there obstructions placed so that personnel will be jeopardized by movements of the crane?
4. Are wind forces in excess of 30 psf expected? If so are special anchorages, tie downs at the home position, or remotely operated rail clamps for all positions (to supplement the primary braking system) provided. Is a wind-indicating device provided for outdoor cranes? Does the device give a visible and audible alarm to operator at a predetermined wind velocity?
5. Are the crane runway columns securely anchored to the foundation? Are they deformed, cracked, or corroded?
6. Is the crane runway structure free of excessive vibration under operating conditions?
7. Are the runway girders or foundations true and parallel?
8. Are the rails securely attached to the girders or foundation?
9. Are the rails level, straight, and spaced to crane span unless specifically designed otherwise?
10. Are the rails adequately spliced? Are joints smooth?
11. Are stops designed to withstand the forces applied to the bumpers? Do the stops engage the bumpers or bumper pads mounted to the bridge?
12. Are lubricating points accessible without the necessity of removing guards or other parts?

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13. Are there loose bolts or rivets?
14. Are sheaves and drums cracked or worn?
15. Are pins, bearings, shafts, gears, rollers, locking and clamping device worn, cracked, or deformed?
16. Are brake system parts, linings, pawls, and ratchets excessively worn?
17. Is the power plant for the crane performing properly?
18. Are the crane hooks deformed or cracked?
19. Are there signs of pitting or deterioration of controller contractors, limit switches, and push button stations?
20. Check the wire ropes for the conditions set forth in paragraph 17.C.02, EM 385-1-1.
21. Does the cab have operating handles within reach of the operator when facing the area to be served by the load block or while facing the direction of travel of the cab? Does the operator have a full view of the cab? Does the operator have a full view of the load block in all positions? If not, are close circuit TV, mirrors, radio, telephone, or signal person(s) utilized during times when load block is not visible to operator? Has the cab been constructed to meet ANSI Standard B 30.2-1990 for overhead and gantry cranes?
22. Does the crane have acceptable and safe access in the form of fixed ladder, stairs, or platform?
23. If the crane has a toolbox, is it securely fastened?
24. Is there a portable fire extinguisher (with a minimum rating of 10 B:C) installed in the cab?
25. Does the cab have sufficient lighting, either natural or artificial, to enable the operator to see the controls?
26. Is electrical equipment located or enclosed so that it is not exposed for inadvertent contact?

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27. Are live parts of electrical equipment protected from exposure to grease, or dirt and moisture?

28. Is the crane equipped with a device(s) to disconnect all motors from the line in the event of power failure?

APPENDIX Z
SAFETY MANAGEMENT EVALUATION

1. Purpose. This Appendix establishes policy and programs for surveying, analyzing, and evaluating Safety Programs throughout the Wilmington District.
2. Applicability. This Appendix applies to all installations (construction field offices, area/resource manager offices, locks and dams, powerhouses, floating plants, etc) within the Wilmington District.
3. References.
 - a. AR 385-10, The Army Safety Program
 - b. OCE Supplement 1 to AR 385-10
 - c. ER 385-1-85, Safety and Occupational Health Program Management Evaluation
 - d. SADvR 385-1-18, Safety Management Evaluation
4. General Policy. It is the policy of the District Commander that the Safety Management Program of each installation of the Wilmington District be surveyed, analyzed, and evaluated annually to determine its effectiveness and compliance with all Federal statutes, U.S. Army and Corps of Engineers safety and health policies.
5. Program Evaluation.
 - a. The Safety Programs of applicable divisions, staff offices, and their field installations (e.g., construction field offices, resource manager's offices, powerhouses and floating plants) in Wilmington District will be evaluated annually by the SOHO. An evaluation of the safety management effort and effectiveness will be furnished the District Commander by the District Safety Office within 30 days of the evaluation. Formal evaluation criteria will be established and utilized in conducting the evaluation. Program administration, work area safety and accident experience will be included.

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b. Guides are provided in Annex I and will be revised as necessary to update programs and place emphasis on special areas, new requirements, or changes in the program. These guides are applicable to construction, operations, resources manager's offices, etc. Non-applicable portions should be deleted as appropriate.

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ANNEX I
SAFETY MANAGEMENT EVALUATION
CHECKLIST

SAFETY MANAGEMENT EVALUATION				
Gov't Unit or Contractor Name: _____		Evaluated By: _____		
Activity or Project Name: _____		Date: _____		
Program Element	Maximum Score	Applicable Score	Actual Score	Comments
SAFETY MANAGEMENT				
Administration and Documentation				
Copy of Commander's Policy Statement	1			
Copy of DR 385-1-1	1			
Copy of Safety Management Action Plan	1			
Documentation of Safety Training	1			
Documentation of Medical Exams	1			
Current Position Hazard Analyses	1			
Activity Hazard Analyses on File	1			
Confined Space Entry Log	1			
Documentation of Safety Meetings	1			
Documentation of Safety and Health Indoctrination	1			
TOTAL SCORE	10			
Emergency Information				
Emergency Evacuation Plans	1			
Employee Accountability Following Evacuation	1			
Emergency Telephone Numbers	1			
TOTAL SCORE	3			
Accident Reporting				
Records of First Aid Treatment	1			
Accident Reporting Meets Reporting Requirements	1			
TOTAL SCORE	2			
Performance Standards				
All Supervisors Have Measurable SOH Standards Incorporated into Their Performance Standards	1			
TOTAL SCORE	1			
Safety Training				
All Safety Training is Current	1			
TOTAL SCORE	1			
Comments:				

SAFETY MANAGEMENT EVALUATION				
Gov't Unit or Contractor Name: _____		Evaluated By: _____		
Activity or Project Name: _____		Date: _____		
Program Element	Maximum Score	Applicable Score	Actual Score	Comments
SAFETY MANAGEMENT CONT.				
Hazard Communication				
Proper Labeling	1			
Current Inventory of Hazardous Chemicals	1			
Conspicuously Located MSDSs	1			
Site Map Showing Location of Substances	1			
TOTAL SCORE	4			
Public Safety				
Public Safety Promotion Programs	1			
Conducts Safety & Health Inspections of Leased Facilities	1			
TOTAL SCORE	2			
Contractor Safety				
Accident Prevention Plan Review and Acceptance	1			
Activity Hazard Analysis Review and Acceptance	1			
Equipment Testing and Inspection	1			
Diving Plan Review and Acceptance	1			
Compliance Inspection (Frequency, Documentation and Follow-up)	1			
Procedures to be Used to Gain Contractor Compliance	1			
TOTAL SCORE	6			
Hazardous and Toxic Waste Activities				
Appropriate Personnel Receive Training	4			
Site Safety and Health Plan Review & Acceptance	6			
TOTAL SCORE	10			
Comments:				

SAFETY MANAGEMENT EVALUATION				
Gov't Unit or Contractor Name: _____		Evaluated By: _____		
Activity or Project Name: _____		Date: _____		
Program Element	Maximum Score	Applicable Score	Actual Score	Comments
HOUSEKEEPING				
Sanitation				
Adequate Supply of Drinking Water Provided	1			
Drinking Water Supplied From an Approved Source	1			
Dispensed by Means That Prevent Contamination	1			
Fountain Dispensers Have Guarded Orifices	1			
Non-potable Water Conspicuously Posted	1			
Appropriate Toilet Facilities Provided	1			
Adequate Ventilation in Toilet Facilities	1			
TOTAL SCORE	7			
Signs				
Danger	1			
Caution	1			
General Safety	1			
Fire and Emergency	1			
Information	1			
Exit	1			
TOTAL SCORE	6			
Material and Tool Storage				
Availability of Material Handling Devices	1			
Safe Storage Height (< 20 ft)	1			
Accessways Are Kept Clear	1			
No Materials Stored on Scaffolds	1			
Lumber Stor. Limited to 1 MBF, 10 ft. from Bldg	1			
Lumber Stacked on Sills and Stacked Level 20 ft Max (16ft if Handled Manually)	1			
Bagged Mat'ls Stepped Back & Cross-keyed	1			
Brick Stacked Not Over 7 Ft	1			
Block Stacked in Tiers on Level Ground	1			
Reinforcing Steel Stored in Orderly Piles Away Walkways and Roadways	1			
Structural Steel Secured to Prevent Sliding Off	1			
Steel Poles, Pipe, Bar Stock and Other Cylindrical Stacked to Prevent Spreading or Tilting	1			
TOTAL SCORE	12			
Comments:				

SAFETY MANAGEMENT EVALUATION				
Gov't Unit or Contractor Name: _____		Evaluated By: _____		
Activity or Project Name: _____		Date: _____		
Program Element	Maximum Score	Applicable Score	Actual Score	Comments
HOUSEKEEPING CONT.				
Tripping Hazards				
Tools, Materials, Extension Cords, Hoses, or Debris Located so as to Not Cause Tripping Hazards	1			
Stairways, Passageways, Gangways, and Accessways are Free of Mat's and Obstructions	1			
Forms and Scrap Lumber and Debris are Kept From Work Areas and Around Bldg Storage Yards and Other Structures	1			
TOTAL SCORE	3			
FIRE SAFETY				
Fire Protection				
Is There a MOU in Place with Local Fire Depts	1			
Are Current Evacuation and Fire Prevention Plans In Place	1			
Are Exits Maintained to Provide Free and Unobstructed Egress	1			
Are Exits Clearly Visible	1			
Are Work Areas Free of Accumulations of Combustible Debris	1			
Is All Fire Extinguishing Equipment Inspected for Defects and Inspected for Defects (Annually)	1			
Are Approved Fire Extinguishers Provided at all Temporary Buildings and Places Where Combustibles Are Stored	1			
Are Motorboats Equipped With Fire Extinguishers	1			
TOTAL SCORE	8			
Flammable and Combustible Storage				
All Sources of Ignition Are Prohibited in Areas Where Flammable and Combustible Liquids are Stored	1			
At Least One Portable Fire Extinguisher Rated at 40-B:C Within 100 Ft	2			
Comments:				

SAFETY MANAGEMENT EVALUATION				
Gov't Unit or Contractor Name: _____		Evaluated By: _____		
Activity or Project Name: _____		Date: _____		
Program Element	Maximum Score	Applicable Score	Actual Score	Comments
Flammable and Combustible Storage Cont.				
Adequate Ventilation to Prevent Accumulation of Flammable Vapors to Hazardous Levels	1			
Approved Containers Used for Storage of Flammable and Combustible Liquids	1			
Storage Cabinets in Compliance with NFPA 30	1			
Combustible Cleaning Materials Are Stored in Closed Metal Containers				
TOTAL SCORE	6			
Fuel Handling				
No Smoking of Open Flame Signs	1			
Portable Fire Extinguisher (20-B:C) Provided on All Tank Trucks	1			
Portable Fire Extinguisher (40-B:C) Provided Within 100 Ft of Each Refueling Area	1			
TOTAL SCORE	3			
PERSONAL PROTECTIVE EQUIPMENT				
Was PPE Selection Based on Hazard Assessments	1			
Were Employees Trained on the Proper Use of PPE	1			
Is Eye and Face Protection Provided and Used	1			
Is Hearing Protection Provided and Used	1			
Is Head Protection Provided and Used	1			
Is Respiratory Protection Provided and Used	1			
Is Proper Fall Protection Provided and Used	1			
Is Appropriate Electrical Protective Equipment Provided and Used	1			
Are Personal Floatation Devices Provided and Used	1			
Is Rescue Equipment Available for Confined Space Entry	1			
TOTAL SCORE	11			
Comments:				

SAFETY MANAGEMENT EVALUATION				
Gov't Unit or Contractor Name: _____		Evaluated By: _____		
Activity or Project Name: _____		Date: _____		
Program Element	Maximum Score	Applicable Score	Actual Score	Comments
INDUSTRIAL AND CONSTRUCTION SAFETY				
Electrical Safety				
All Wiring and Equipment Listed by a Nationally Recognized Testing Laboratory	1			
Flexible Cords are Hard Usage or Extra Hard Usage	1			
Flexible Cords are Used in Continuous Lengths	1			
All Circuits Grounded	1			
All Receptacle Outlets That Provide Temporary Electrical Power Have GFCI	1			
Batteries of the Non-sealed Type Stored in Enclosures With Outside Vents	1			
Eyewash and Emergency Drenching Facilities	1			
TOTAL SCORE	7			
LockOut/TagOut				
Hazardous Energy Control Plan (LO/TO) in Place	1			
Approved LO/TO Devices	1			
LO/TO Training	1			
TOTAL SCORE	3			
Hand and Power Tools				
Tested and Certified by a Nationally Recognized Testing Laboratory	1			
Equipped With Proper Guarding	1			
Nonconducting Hoses on Hydraulic or Pneumatic Tools	1			
TOTAL SCORE	3			
Rigging				
Rigging Properly Stored	1			
Running Lines Within 6 ft-6in of Ground or Working Level is Guarded	1			
Eye Splices made in an Approved Manner	1			
Positive latching Device Used When Hoisting Loads	1			
TOTAL SCORE	4			
Comments:				

SAFETY MANAGEMENT EVALUATION				
Gov't Unit or Contractor Name: _____		Evaluated By: _____		
Activity or Project Name: _____		Date: _____		
Program Element	Maximum Score	Applicable Score	Actual Score	Comments
INDUSTRIAL AND CONSTRUCTION SAFETY CONT:				
Mechanized Equipment				
Inspected and Certified to be in Safe Operating Condition	1			
Records of Test Maintained at the Job Site	1			
Daily Shift Inspections	1			
ROPS	1			
FOPS	1			
Seat Belts Provided and Used	1			
Reverse Alarm	1			
Anti-Two Block Device on Non-Duty Cycle Cranes	1			
Boom Angle Indicator	1			
Control Barriers for Truck and Crawler Cranes Aboard Barges	1			
TOTAL SCORE	10			
Welding				
Proper Ventilation	1			
Respiratory Protection (When Required)	1			
Fire Extinguishing Equipment Provided	1			
Free of Combustibles	1			
Free of Explosive Gases	1			
TOTAL SCORE	5			
Pressurized Equipment				
Temporary Equipment Inspected Semi-Annually	1			
Permanent Equipment Inspected Annually	1			
Hydrostatic Testing of Unfired Pressured Vessels				
Installation	1			
After Lay-Up	1			
After Repairs	1			
Every Three Years	1			
Records of Inspections	1			
Compressed Gas Cylinders Stored in Well Ventilated Locations	1			
Cylinders Containing the Same Gas Stored in Segregated Groups	1			
Comments:				

SAFETY MANAGEMENT EVALUATION				
Gov't Unit or Contractor Name: _____ Activity or Project Name: _____	Evaluated By: _____			
Program Element	Maximum Score	Applicable Score	Actual Score	Comments
INDUSTRIAL & CONSTRUCTION SAFETY CONT.				
Pressurized Equipment Cont.				
Cylinders Separated from Flammable or Combustible Liquids and Other Ignitable Materials by At least 40 ft or by Fire Wall with a 1-Hour Rating	1			
Smoking Prohibited Around Cylinders	1			
TOTAL SCORE	11			
Safe Access and Fall Protection				
Is There a Ramp, Ladder, or Personnel Hoist Available Where There are Vertical Breaks > 19"	1			
Are Guardrails, or Other Forms of Provided at Locations from Which Workers May Fall 6 Ft. or More	1			
Have Employees Received Fall Protection Training	1			
Does Guardrail Have Top, Mid and Bottom Rails	1			
Are Fixed-Rail Ladders 16" Clear Between Rails	1			
Are Wood Toprails a Minimum of 2x4	1			
Are Wood Midrails a Minimum of 1x6	1			
Are Post a Minimum of 2x4 at 8'oc	1			
Are Pipe Railings, Top & Bottom a Minimum of 1-1/2"	1			
Are Post a Minimum of 1-1/2"	1			
Are Individual Rung/Step Ladders 16" Clear Between Rails	1			
Are Toeboards a Minimum of 1x4	1			
Are Portable Ladders 11.5" Clear Between Rails	1			
Do Ladders Have Slip-Resistant Feet	1			
Is Anti-Two Block System Installed for Crane Supported Personnel Hoist	1			
Are Scaffolds Plumb and Level	1			
Do Scaffolds Bear on Base Plates	1			
Are Working Levels of Work Platforms Fully Planked	1			
Is Planking Secured From Movement	1			
Does Planking Extend 6" Over End Supports	1			
Is Scaffolding With Height That Exceeds Four Times the Width of the Base Secured to the Wall or the Structure	1			
TOTAL SCORE	21			
Comments:				

SAFETY MANAGEMENT EVALUATION				
Gov't Unit or Contractor Name: _____		Evaluated By: _____		
Activity or Project Name: _____		Date: _____		
Program Element	Maximum Score	Applicable Score	Actual Score	Comments
INDUSTRIAL & CONSTRUCTION SAFETY CONT:				
Excavation and Trenching				
Are Sides of Excavations Guarded	1			
Is Water Prevented From Entering the Excavation	1			
Is Excavated Material Placed at Least 2 Ft From the Edge	1			
Are Provisions Provided to Prevent Personnel Vehicles, and Equipment from Falling into Excavations	1			
Are Two or More Means of Egress Provided for Excavations 4 Ft Deep and Greater Than 25 Ft Long	1			
Are Cofferdams Provided with Standard Railings or Other Protection	1			
Are Two Means of Access Provided on Cofferdams	1			
TOTAL SCORE	7			
Concrete and Masonry Construction, and Steel Erection				
Are Rebar Caps in Place	1			
Powered Troweling Machines Are Provided with Automatic Control Switches	1			
Structural and Reinforcing Steel is Supported or Guyed to Prevent Overtuning	1			
Limited Access Zone Established for Masonry Wall Construction	1			
Masonry Walls Greater Than 8 Ft is Adequately Braced	1			
TOTAL SCORE	5			
Confined Space Entry				
Facility or Activity Has a Permit-Required Confined Space Entry Plan	1			
All PRCs Are Identified with Appropriate Signage	1			
All Testing and Monitoring is Provided	1			
Comments:				

SAFETY MANAGEMENT EVALUATION				
Gov't Unit or Contractor Name: _____ Activity or Project Name: _____	Evaluated By: _____ Date: _____			
Program Element	Maximum Score	Applicable Score	Actual Score	Comments
INDUSTRIAL & CONSTRUCTION SAFETY CONT:				
Confined Space Entry Cont:				
Ventilating Equipment is Provided	1			
Communications Equipment is Provided	1			
All Required PPE is Provided	1			
Rescue Equipment is Provided	1			
Is a Log of Confined Space Entries Maintained	1			
TOTAL SCORE	8			
GRAND TOTAL	181			
EVALUATION RATING:				
Comments:				
Evaluation Score = Actual Score/Applicable Score(100%)				

APPENDIX AA
ASBESTOS IDENTIFICATION AND PROTECTION PROGRAM

1. Purpose. This Appendix establishes a formal asbestos operations and maintenance program to educate and inform District personnel of the health risks and proper maintenance procedures when working with asbestos containing materials.
2. Applicability. This Appendix is applicable to all U.S. Army Corps of Engineers, Wilmington District personnel and all contractors conducting business with the Wilmington District.
3. References.
 - a. 29 CFR 1910.1001, Asbestos
 - b. AR 200-1, Environmental Protection and Enhancement, Chapter 10
 - c. EPA 20 T-2003, "Managing Asbestos in Place. A Building Owners Guide to O&M Programs for Asbestos Containing Materials"
4. General. Asbestos is a known human carcinogen. Although it is difficult to quantify the precise risk posed by exposure to asbestos in buildings and facilities, unnecessary exposure to asbestos should be avoided. The goal of this Appendix is to inform personnel of the presence of asbestos in the workplace and provide guidance for the routine and emergency maintenance involving asbestos. Adherence to this guidance will help maintain an environment free of asbestos contamination within District buildings and facilities.
5. Program Objectives. The objectives of this program are to:
 - a. Clean up asbestos fibers previously released.
 - b. Prevent future release by minimizing asbestos containing materials (ACM).
 - c. Monitor the condition of asbestos within the District buildings and facilities.

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The program will remain in effect until all asbestos containing materials are removed from all District facilities.

6. Asbestos Containing Material (ACM) Classification. Asbestos containing material is any material with a concentration of greater than 1% asbestos by weight. Asbestos is generally classified into 3 categories:

a. Surfacing Material. This is ACM which is sprayed or troweled on structural members, ceilings and plaster coatings. This material is also an excellent fire proofing material.

b. Thermal Insulation. This ACM is usually found on pipes, boilers, mufflers, and duct work. It is an excellent material for insulation where heat and moisture control are necessary.

c. Miscellaneous Materials. This ACM is found in floor tiles, wall board, cement, brake pads, and other applications where either strength or durability are necessary.

Asbestos material in the first two categories pose the highest risk of exposure. These materials tend to release fibers easily when disturbed. This tendency is called Friability. Asbestos contained in the third category is bonded with other material, however fibers can be released through actions of cutting, grinding or breaking of the material. For this reason **ALL** asbestos containing materials should be handled as friable.

7. Implementing the Program. The program shall be implemented for a building or facility as soon as asbestos material of any type is confirmed. A program coordinator shall be designated for that building or facility. The program coordinator will be responsible for the procedures applied to building/facility, routine cleaning, maintenance, general operations and renovation. Use of proper procedures for the aforementioned operations will help ensure the asbestos material will remain in good condition. These procedures involve:

a. Notification to employees that asbestos is present within the building or facility.

b. Training workers in the proper procedures for cleaning and maintenance in areas where asbestos is present.

c. Periodic inspection of the ACM to determine it's condition.

d. Medical Surveillance for personnel who routinely work around asbestos material.

8. Program Elements. Several aspects of the program remain the same for all types of asbestos containing materials. For clarity, these aspects are repeated for each type of ACM.

a. Special Practices For Surfacing Materials. Due to the ease with which sprayed or troweled on ACM becomes friable, it is often the major source of airborne contamination within buildings and facilities. Surface areas covered with this type of ACM tend to be large. Fibers are released from this material through touching, bumping, or from aging of the material. To reduce the potential for airborne release of fibers the following procedures shall be observed when this material is discovered:

(1) Notification and Education. Inform all occupants, maintenance, and custodial personnel of the presence of asbestos within the building or facility. All personnel shall know the exact location of the asbestos and instructed not to disturb or damage the material. All maintenance and custodial workers shall be properly trained in the cleaning and maintenance of asbestos materials. These personnel shall be physically qualified to wear a respirator and shall be included in the District Respiratory Protection Program and the Asbestos Surveillance Program. Appropriate warning labels will be attached adjacent to the asbestos and non-asbestos material. Warning labels shall read as follows:

WARNING ASBESTOS PRESENT. HAZARDOUS DO NOT DISTURB WITHOUT PROPER TRAINING AND EQUIPMENT

ASBESTOS FREE MATERIAL

(2) Work Practices For Cleaning And Custodial Operations. Routine cleaning involving asbestos shall be performed with the occupants out of the area to be cleaned. Dry brooms, mops, rags, or standard vacuum cleaners shall **not** be used in areas that contain asbestos. This equipment tends to re-suspend the asbestos fibers

creating a health hazard. All cleaning in areas containing asbestos shall be performed within the following guidelines:

(a) Mops, brooms, and cloths shall be kept moist using water or a dust suppressant.

(b) All cleaning materials shall be changed frequently to ensure that fibers are not escaping.

(c) Spray with water any debris found in the area and remove using dust pan.

(d) Use a vacuum which contains a High Efficiency Particulate Air (HEPA) filter on all carpets.

(e) Wet mop all floors and wet wipe all horizontal surfaces.

(f) All mop heads, cloths, and debris shall be placed in plastic bags properly labeled, and disposed of in accordance with federal and local regulations.

(g) All reusable equipment shall be washed thoroughly, dried, and placed in a separate area from normal cleaning equipment.

(3) Work Practices For Maintenance Activities. Normal maintenance activities can disturb ACM sites and cause a release of fibers. It is necessary for all workers involved in the maintenance activities where there are asbestos materials to be properly trained in the handling and removal of asbestos materials. The District SOHO shall be informed of these activities prior to the commencement of work. Problems with maintenance activities in areas containing asbestos usually involve three activities:

(a) Conducting routine maintenance and repair work.

(b) Entering areas with potentially high concentrations of fibers.

(c) Expanding or rehabilitating a work space.

If disturbance of ACM is **unlikely**, no precautions other than normal care in performing the work is needed. If minor disturbance is **likely**, the area should be sprayed with a mist of amended water (water and a surfactant) before work begins. All electrical systems shall be shut off before any water is applied to an area. If there is a possibility of **significant** disturbance the SOHO shall be notified prior to the start of work. In all situations involving ACM the worker shall wear, as a minimum, a half-face respirator with HEPA filters.

(4) Special Practices For Thermal Insulation. ACM thermal insulation presents a less significant hazard for fiber release. Unless the ACM is damaged, the protective jacket will contain any fiber release. The program for thermal insulation is focused on identification and informing the affected personnel of the location of the ACM.

(a) Notification and Education. Refer to 6(b).

(b) Work Practices for Cleaning and Custodial Operations. Refer to 6(c).

(c) Work Practices for Maintenance Activities.

(1) Maintenance activity which could affect ACM includes ACM covered pipes, boilers, valves, and duct work. Maintenance usually involves plumbing and HVAC repair. Only those personnel properly trained in asbestos handling and removal and physically qualified to perform this work shall perform maintenance activities involving ACM disturbance.

(2) If disturbance of the ACM is **unlikely**, normal precautions only need to be observed. **NOTE** vibration created from maintenance activities in one area can cause a disturbance and fiber release in another area. If this situation arises, correct the problem where the fiber release is expected prior to any other maintenance work. If there is a **significant** possibility of fiber release, notify the SOHO prior to commencement of work. After minor ACM insulation has been properly removed, replace the insulation with non-asbestos mastic, insulation, and protective jackets. All ACM material shall be disposed of in accordance with federal and local regulations.

(5) Special Practices for Miscellaneous ACM. Most of the ACM that is neither surfacing or thermal insulation falls into this category. These materials are usually hard and non-friable. Fibers can be released through cutting, grinding, or other manipulations of the material.

(a) Notification and Education. Occupants, custodial, and maintenance workers shall be informed of the presence and location of ACM in the area. Maintenance workers shall be trained in the handling and removal of ACM safely.

(b) Work Practices for Maintenance Activities. Where disturbance of the ACM cannot be avoided the following procedures shall be in effect:

(1) The ACM shall be misted with amended water to help prevent fiber release. Ensure all electrical connections have been shut off prior to misting activities.

(2) Cutting, drilling, or grinding of the material shall be performed with equipment which has HEPA vacuum systems.

(3) Avoid removing, sanding or stripping floor tiles containing ACM. If tiles are removed **DO NOT** sand the backing material remaining on the floor.

(4) In all cases this maintenance work shall be performed with the occupants out of the area.

9. Periodic Inspections. At least twice a year an inspection of ACM in all buildings and facilities shall be conducted by personnel trained and certified by AHERA to perform building inspections. This action will help ensure that any damage or deterioration of the ACM will be detected and corrective action taken. Results of the inspection will be documented and placed in the permanent asbestos file for the particular building or facility.

10. Procedures for a Fiber Release Episode. A minor episode such as, a small piece of insulation falls, water damaged insulation or accidental disturbance of sprayed on ACM can be

cleaned up using standard wet cleaning and maintenance practices for ACM described in Section 6.1.2. Workers shall wear half-face respirators with HEPA cartridges as a minimum protection during clean up. The damaged area shall be repaired with asbestos-free material and the ACM shall be disposed of in accordance with federal and local regulations. If a major release occurs, maintenance workers shall evacuate the affected area of personnel, shut down ventilation systems to contain fibers in as small an area as possible, and seal the area with 6-mil plastic sheeting. Appropriate warning labels shall be placed adjacent to the affected area. The District SOHO shall immediately be notified after taking these precautions. Most major releases fall outside the expertise of maintenance workers and will have to be cleaned up by a certified asbestos contractor.

11. **Respiratory Protection Program.** The District Respiratory Protection Program shall be in force during all phases of the program that involves exposure to asbestos fibers. The District SOHO shall provide sources for respirator fit testing and training for personnel involved in asbestos related work. ALL custodial and maintenance workers involved in asbestos related work shall be included in the Respiratory Protection Program.

12. **Medical Surveillance.** Any employee exposed to asbestos fibers in a concentration greater than 0.1 fibers per cubic centimeter of air (f/cc) shall be included in the Asbestos Surveillance program. ALL custodial and maintenance workers involved in ACM related activities shall be included in the Asbestos Surveillance program.

13. **Training.** All of the work practices and procedures outlined in this program shall be utilized by District buildings and facilities that contain ACM. The program shall become part of the permanent file for each affected building or facility. The file shall be available to all personnel who work within the building or facility. This program will be the basis of the District training and awareness program for in-house and new employees. Training shall be coordinated through the SOHO and contain as a minimum the following items:

- a. The uses and health effects of asbestos.
- b. The location of ACM within the building or facility.

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c. The asbestos control program for the building or facility.

d. The District Asbestos Identification and Protection Program.

14. Recordkeeping. All aspects of the District Asbestos Identification and Protection Program shall be maintained and stored at the District SOHO. Records for each employee included in the Asbestos Surveillance program shall be maintained for a period of 40 years. All asbestos related training, including annual refresher training shall be maintained at the SOHO.

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APPENDIX BB
HAZARDOUS MATERIAL EMERGENCY RESPONSE

Procedures for hazardous material emergency response are contained in CESAW PLAN 500-1-7 and are applicable to all Wilmington District activities.

APPENDIX CC
A SUMMARY OF OCCUPATIONAL SAFETY AND HEALTH
ADMINISTRATIVE, TRAINING AND INSPECTION REQUIREMENTS

1. Purpose. This Appendix has been prepared to aid in determining the appropriate administrative, training and inspection requirements that are applicable to District activities. It details a good number of items but should not be considered all-inclusive.

2. Applicability. This Appendix applies to all U.S. Army Corps of Engineers, Wilmington District personnel and all contractors conducting business with the Wilmington District.

3. References.

a. 29 CFR 1910, Occupational Safety and Health Standards for General Industry

b. 29 CFR 1926, Occupational Safety and Health Standards for the Construction Industry

c. EM 385-1-1, US Army Corps of Engineers Safety and Health Requirements Manual

4. Administrative Submittals Required.

a. Project Safety and Health Plan. The project safety and health plan is required by paragraph 01.A.05 of EM 385-1-1. The plan shall be developed and implemented on USACE facilities and activities where employees are engaged in other than routine office and administrative functions (i.e., O&M, recreational resource management, surveying, inspection and testing, construction management, warehousing, transportation, etc). It should address applicable items listed in Appendix A of EM 385-1-1 in addition to District requirements. Items to be addressed include the following: normally the location for the Project's Confined Space Entry Program, Hazardous Energy (LOTO) procedures, Bloodborne Pathogen Exposure Control Plan, Respiratory Protection Program, Hearing Conservation Program, Hazard communication Program, Asbestos O&M Program, critical lift procedures, as well as any other required project specific program or procedures). The plan shall be reviewed annually and updated if required.

b. Accident Prevention Plan (APP). Accident prevention plans are applicable to contractor work and are required by paragraph 01.A.07 of EM 385-1-1. The plan shall be prepared by the prime contractor prior to commencement of work at the jobsite. The plan shall be prepared by qualified personnel and signed by a competent person and a representative of the prime contractor's project management team. The plan shall be comprehensive and cover the work performed by subcontractors, suppliers and vendors. **Separate or individual plans submitted by subcontractors are not acceptable.** The plan shall be reviewed by the Safety Office.

c. Activity Hazard Analysis (AHA). An AHA is required by section 01.A.10 of EM 385-1-1 for each USACE activity as warranted by the hazards associated with the activity (generally for all USACE field operations including inspections for structural stability). An AHA is a document that outlines the steps required to accomplish an activity, the actual or potential hazards of each step and the measures to eliminate or control those hazards. In general, an AHA is appropriate to identify the controls for a major phase of work. Employees need to review the AHA for a particular activity prior to beginning it, each time the AHA is modified to address new hazards, and as often as necessary to ensure they adhere to safe work procedures. For contractors, an AHA must be developed before beginning each work activity involving a type of work presenting hazards not experienced in previous project operations or where a new crew or subcontractor is performing the work. Work may not begin until the AHA for that activity has been accepted by the COR and discussed with all appropriate personnel.

d. Asbestos Abatement Plan. An asbestos abatement plan is required by paragraph 06.B.05 of EM 385-1-1 when there is an identified asbestos hazard. The written plan details compliance with OSHA and EPA asbestos abatement requirements and shall be submitted to the SOHO for review and recommended acceptance prior to initiation of work at the jobsite.

e. Blasting Safety Plan. As per section 29 of EM 385-1-1, prior to bring explosives on site, the contractor shall develop and blasting safety plan. It shall be reviewed by the SOHO and accepted by the COR prior to initiation of site work.

f. Confined Space Entry Program. As per paragraph 06.I.04 of EM 385-1-1, each USACE and contractor activity, and each USACE facility shall maintain a permit-required confined space (PRCS) program. The program shall include, as a minimum, PRCS entry procedures, monitoring, ventilation, communications and other safety equipment, training, medical clearances, PPE, permit requirements, and other pertinent data. Each PRCS program, COE or contractor shall be submitted to the SOHO for review and prior to acceptance.

g. Critical Lift Plan. As per paragraph 16.C.18 of EM 385-1-1, critical lift plans are required for every USACE and contractor non-routine lift that requires detailed planning and additional or unusual safety precautions. Critical lifts include the following:

- (1) Lifts made when load weight is 75% of the rated capacity of the crane.
- (2) Lifts that require the load to be lifted, swung or placed out of the operator's view.
- (3) Lifts made with two or more cranes.
- (4) Lifts involving non-routine or technically difficult rigging arrangement.
- (5) Hoisting personnel with a crane or derrick.
- (6) Any lift that the lift or crane operator believes should be considered critical.

h. Dive Operations Plan. As per Section 30 of EM 385-1-1, a dive plan shall be developed, submitted, and implemented by contractors for each separate dive operation. It shall be submitted to the District Diving Coordinator or Alternate for review and acceptance prior to the commencement of dive operations. A copy of the accepted plan shall be at the diving location.

i. Employee Emergency Evacuation and Fire Prevention Plans. As per paragraph 01.E of EM 385-1-1 and OSHA Standard 1910.38, a written plan shall be developed and reviewed with each employee upon initial assignment, and shall be kept at the workplace and

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made available for periodic employee review. The plan shall designate the persons who will assist in the safe and orderly emergency evacuation of employees and visitors.

j. Fall Protection Plan. As per paragraph 01.A.09 of EM 385-1-1, an activity hazard analysis (AHA), shall be prepared for government and contractor activities in which workers are exposed to falls of 6 feet or more. The AHA shall be prepared prior to any work being performed and made a part of the Accident Prevention Plan for contractor activities. Where applicable, the AHA shall be made a part of government Project Safety and Health Plans. The AHA should include types of fall protection being used and name of competent individual.

k. Position Hazard Analysis (PHA). As per paragraph 01.A.06 of EM 385-1-1, a position hazard analysis is required for each USACE position. The PHA is a document that lists the duties or tasks of an employee's position, the potential or actual hazards of each duty and the measures to eliminate or control those hazards. The PHA should be reviewed by the individual employee upon assignment, **reassignment**, anytime new hazards are created, and annually to reinforce the understanding of all hazards and controls. PHAs shall be updated as required to incorporate new hazards and controls.

l. Lead Abatement Plan. As per paragraph 06.B.05 of EM 385-1-1, where there is a potential or identified lead hazard, a written plan detailing compliance with OSHA and EPA lead abatement requirements shall be developed, and submitted to the SOHO for review and recommended acceptance prior to initiation of work on site.

m. Site Safety and Health Plan (SSHP). As per paragraph 28.B of EM 385-1-1, a SSHP shall be developed and implemented when employees are engaged in HTRW activities, to include preliminary assessments and underground tank work. The SSHP must have a cover sheet for appropriate signatures; shall be submitted, reviewed and recommended for acceptance by the SOHO prior to commencement of work.

n. Wildfire Control Plan. As per paragraph 09.K of EM 385-1-1, a wildfire control plan shall be developed at all facilities and areas with potential exposure to wildfire. The plan shall be distributed to all key wildfire control officers and shall be updated at least annually.

2. Training Requirements. An initial list of occupational safety and health training requirements for District personnel is provided below. This list deals with USACE required training as well as that which is specifically stipulated by OSHA standards and other regulations.

Note: Within the following descriptions, the term "Competent Person" is used. This normally means "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them." Normally someone who, by way of his or her training, experience, and knowledge is considered well versed in the subject matter. Competency is normally determined by the Site manager, however, the Safety Office may be consulted for final determination.

a. All Terrain Vehicles (ATV). As per paragraph 18.D.01 of EM 385-1-1, every operator of an ATV shall complete an ATV training course, of approximately 4 hours, prior to operation of the vehicle. Every operator must possess a valid state driver's license. Refresher training is recommended.

b. Asbestos Abatement. As per 29 CFR 1926.1001 and OSHA Instruction CPL 2-2-63, asbestos abatement training shall be provided prior to initial assignment of related duties and annually thereafter. **Note: Employees that receive the initial training and do not receive the annual refresher training will be required to re-take the initial training prior to subsequent assignment of related duties.**

(1) Inspecting Buildings for Asbestos-Containing Materials. All employees who will be conducting surveys and assessments for ACM will receive approximately three days of training. Employees responsible for evaluating data gained from the survey will receive the same training. The training must be an EPA approved AHERA course. An 8-hour refresher is required.

(2) Managing Asbestos in Buildings. All employees who have completed the course Inspecting Buildings for ACM and who will be responsible for developing and implementing management plans for asbestos in buildings (and other facilities) will receive two days of training from a commercially available source, with an annual 8-hour refresher.

(3) Supervision of Asbestos Abatement Projects (Competent Person). All employees who perform, supervise, or oversee asbestos work are required to take this course. For those limited to Class III and IV work, training equivalent to the 16-hour O&M course is acceptable. Otherwise this training must be obtained at a comprehensive 5-day EPA Model Course for Supervisors. This training includes individual respirator fit-testing, 14 hours of hands-on training and a written examination of 100 multiple choice questions with a passing level of 70%. The course shall consist of 40 hours, available commercially with an annual 8-hour refresher.

(4) Designing Asbestos Response Actions. This course is required for design professionals involved in asbestos response actions. An advanced course must have Supervision course or equivalent to register. The course is approximately 32 hours and is available commercially with an annual 8-hour refresher.

(5) Abatement Courses.

(a) Class I for removal of thermal insulation containing more than 1% asbestos from pipes, fittings, boilers, tanks, ducts, etc requires four days of Asbestos Abatement Worker Training. This training also includes individual respirator fit-testing, 14 hours of hands-on training and a written examination of 50 multiple choice questions with a passing level of 70%. The course is approximately 32 hours and is available commercially with an 8-hour annual refresher.

(b) Class II for roofing, flooring, siding, ceiling tiles or transite panels requires 8-hours. The training is abbreviated because it does not entail the in-depth training about enclosures, ventilating equipment, medical surveillance, air monitoring and respiratory protection required for Class I abatement. Training shall include hands-on training.

(c) Class III for repair and maintenance operations (O&M Worker Training) where ACM or Presumed ACM (PACM) is likely to be disturbed. The course shall include hands-on training and be at least 16-hours in length.

(d) Class IV for maintenance and custodial activities during which employees contact but do not disturb ACM or PACM. This is a 2-hour "asbestos awareness" training for maintenance and custodial workers. Annual refresher training is required but the length of such training is not specified. Can be obtained from an in-house "competent" person or from an outside vendor.

(e) Occupant Asbestos Awareness Training. Facility managers of building containing ACM shall notify building occupants through written notices or awareness training sessions about the building's O&M program.

c. Bloodborne Pathogens (BBP) Training. This training is required by 29 CFR 1910.1030. The purpose is to prevent the spread of BBP for employees reasonably anticipated to have occupational exposure to blood or other potentially infectious materials. Training is at the time of initial assignment to tasks involving such exposures and at least annually thereafter. Initial training for train-the-trainers is approximately. Training for others, approximately 4-hours, is required annually. Training is available commercially. An Exposure Control Plan is required for each worksite with appropriate hazards.

d. Boat Operations. EM 385-1-1 and ER 385-1-91 requires employees operating boats less than 26 feet in length to successfully complete a HQUSACE-approved boat operator's course and be licensed prior to official operation of a USACE vessel. Training is available from in-house licensed examiners.

(1) District Motorboat Director. Must be a graduate of the 40-hour HQUSACE-approved Motorboat License Examiner Training Course.

(2) Other District Motorboat Instructors. Must be graduates of the 40-hour HQUSACE-approved Motorboat License Examiner Training Course. To maintain this certification, USACE employees must participate as an instructor in at least on 24-hour motorboat training course or 8-hour refresher every three years. If an instructor fails to meet this requirement, their certification is revoked and can only be reinstated once the employee attends and passes another 40-hour Examiner Training Course.

(3) Motorboat Operators must complete a 24-hour HQUSACE-approved Motorboat Operator Training Course and be licensed prior to official operation of vessels. All motorboat operators must attend an 8-hour refresher training course every five years to maintain certification. Those operating boats greater than 26 feet require a valid US Coast Guard license appropriate for the size and type vessel they operate.

e. Permit-Required Confined Space Entry. Section 06.I of EM 385-1-1 and 29 CFR 1910.146 requires that all employees that are required to enter a permit-required confined space (PRCS) be trained to acquire the understanding, knowledge and skills necessary for the safe performance of their assigned duties and responsibilities. This includes rescue teams involved in any PRCS work, as well as those that monitor the programs of others. Training shall be provided prior to assignment of PRCS related duties, before a change in assigned duties, whenever conditions affecting PRCS change, whenever installation officials have reason to believe that there are inadequacies in knowledge or use of the procedures. Annual rescue drills shall also be conducted. Each employee must be certified by the instructor as being trained. For persons required to monitor the programs of others (e.g., construction inspectors, QA's) an 8-hour awareness course must be taken. Training ranges from 8 to 32-hours, depending on the degree of detail needed and can be obtained from in-house or commercial sources.

f. Crane Safety. EM 385-1-1 and 29 CFR 1926.550 requires the employer to designate a competent person to inspect all hoisting machinery and equipment prior to and during use. A thorough annual inspection of the hoisting machinery shall be made by a competent person or a government or private agency recognized by the US Department of Labor. As stipulated in Appendix G of EM 385-1-1, all USACE crane operators shall successfully complete, every three years, a 24-hour crane operators course. The course shall include a written and a practical operating examination. An 8-hour annual refresher course shall also be provided to each operator (practical only, written or oral exam required until third year). Contractor and derrick operators shall be designated as qualified by a source that qualifies crane and derrick operators (i.e., an independent testing and qualifying company, a union, a governmental agency, a qualified consultant).

g. Defensive Driving. SAWDR 385-1-1 and SADvR 385-1-1 requires all team members that drive government vehicles, rental cars or POVs while on official duty to complete a defensive driving course prior to assuming driving duties. After initial training, the course shall be completed every three years thereafter to reinforce proper driving procedures. Training is approximately 4-8 hours and is available on the local area network.

h. Diving. EM 385-1-1 and ER 385-1-86 requires that training be provided prior to initial assignment of related duties.

(1) Corps Divers shall successfully complete a basic SCUBA diving course recognized by the National SCUBA Training Council and a HQUSACE-approved diving course. They must also complete at least 12 working or training dives per year and successfully complete an HQUSACE-approved Diving Refresher course at least every four years. Prior to each dive, all members of a dive team shall attend a pre-dive conference that addresses safety, among other things. Additionally, all divers must have current certification in CPR and first aid. Specific information about the diving program can be found in ER 385-1-86.

(2) Dive Supervisors must be a graduate of the HQUSACE-approved Diving Supervisor Training course prior to supervising diving activities. Supervisors shall be able to swim and be capable of performing in-water rescue activities during the Diving Supervisor's Training course. Supervisors must participate in 12 working or training dives per year to maintain proficiency. If required working or training dives are not accomplished within 18 months, dive supervisor must attend the HQUSACE-sponsored Diving Supervisor Refresher course to regain certification. All diving supervisors must attend s Supervisor Refresher course at least every four years.

(3) Diving Inspectors must be a graduate of the HQUSACE-approved Diving Safety, Diving Supervisor or Diving Inspector Course and shall maintain certification by attending a HQUSACE-sponsored course every four years.

(4) District Diving Coordinator (DDC) must be a graduate of the HQUSACE-approved Diving Safety or Diving Supervisor Training course and shall maintain certification by attending the diving refresher course every four years.

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(5) Alternate Diving Coordinator must be a graduate of the HQUSACE-approved Diving Safety or Diving Supervisor Training course and shall maintain certification by attending the diving refresher course every four years.

i. Drilling. Paragraph 16.M.04 of EM 385-1-1 requires all members of drilling crews be trained based on equipment operating manual and hazards analysis for the activity. Training shall be provided at the time of job assignment by the foreman, supervisor with coordination from the SOHO if needed. On-going on-the-job training should address pertinent issues.

j. Emergency Evacuation and Fire Prevention Plans. EM 385-1-1 and 29 CFR 1920.38 requires that all employees be trained upon initial assignment to an organization and at least annually thereafter (the frequency depends on the facility). The training shall deal with handling emergency situations, including the use of emergency and rescue or life saving equipment, drills and implementing the elements of the plans.

k. Emergency Spill Response (HAZWOPER - Hazardous Waste Operations and Emergency Response). Twenty nine CFR 1910.120 requires employees to be trained to provide their designated level of response to hazardous substance spills. The levels are First Reponder Awareness Level, First Responder Operations Level, Hazardous Materials Technicians, Hazardous Materials Specialist and On-Scene Incident Commander. After the initial 40-hour spill response training, team members are required to have an 8-hour refresher annually, including an emergency drill in response to a simulated hazardous chemical spill. All training is obtained from a commercial source.

l. New Employee Orientation. All employees, including temporary, labor, summer-hires, interns, students and trainees shall be trained about his/her job hazards and related control measures. Training shall be accomplished by way of the position hazard analysis, the organization's safety and health policies. Additional discussions shall include responsibilities and procedures for safe work practices, accident reporting procedures for identifying and correcting unsafe work conditions and practices, provisions for medical facilities and emergency response and all other applicable safety and health requirements.

m. Ergonomics - Cumulative Trauma Prevention. Section 06.K of EM 385-1-1 requires all workers performing activities that stress the body's capabilities be trained to perform their work in a manner to prevent cumulative trauma. Work activities include lifting, handling, carrying, rapid and frequent application of high grasping forces, and repetitive hand and arm manipulations. The training is approximately 2 hours and is available from commercial sources.

n. Explosive Actuated Tools. Section 13.E of EM 381-1-1 requires that only qualified operators use explosive actuated tools. Qualified operators are persons that have been:

(1) Trained by an authorized instructor (one who has been trained, authorized and provided an authorized instructor's card by the tool manufacturer or by an authorized representative of the tool manufacturer).

(2) Passed a written examination provided by the manufacturer of the tool.

(3) Possesses a qualified operator's card supplied by the manufacturer and signed by both the instructor and the operator.

o. Fall Protection. Paragraph 21.A.16 of EM 385-1-1 and 29 CFR 1926.503 requires fall protection training for each employee that may be exposed to fall hazards. The employer must ensure that a competent person teaches affected employees about the nature of fall hazards in the work area. Retraining shall occur as necessary to maintain employee understanding and knowledge of compliance. The employee must have written certification for all fall protection training received. Training normally ranges from 2-4 hours, depending on the level of training needed. The training is available from commercial sources.

p. Portable Fire Extinguishers. Paragraph 09.E. 04 of EM 385-1-1 and 29 CFR 1910.157 requires training for employees that may use portable fire extinguishers while responding to fires. Training shall be provided upon assignment of related duties and at least annually thereafter. Training may be performed in-house, by videos, or by local fire department representatives.

q. First Aid/CPR. Paragraph 03.A.02 or EM 385-1-1 and 29 CFR 1910.151 requires that adequate numbers of employees are trained to provide emergency first aid when medical assistance is not readily available. When a medical facility or physician is not available within 5 minutes, at least two first aid attendants shall be available on each shift, having current certification in first aid and CPR from the American Red Cross or equivalent. Employees that work alone in remote areas shall also be first aid certified.

r. Forklifts and Powered Industrial Vehicles. Twenty nine CFR 1910.178 requires training for all employees that operate forklifts, tow motors, platform lift trucks and other powered industrial trucks. A program must be in place that addresses training in the safe operation of these vehicles and certification (issuing valid permits, OF 346). Initial training is required with annual refresher. Training is available from in-house competent person or commercial source.

s. Hazard Communication (HAZCOM). EM 385-1-1 requires that a hazardous communication program be implemented, in accordance with 29 CFR 1910.1200, for all employees potentially exposed to hazardous chemicals in the workplace. Training consists of an initial four-hour DOD Federal Hazard Communication Program videotape with workbook, a worksite-specific review of material safety data sheets (MSDS) and the HAZCOM Standard, a review of the MSDS for each new hazardous chemical introduced into the workplace and annual worksite-specific refresher training. The worksite-specific training normally requires less than an hour.

t. Hazardous, Toxic and Radiological Waste, HTRW. Section 29 of EM 385-1-1 and 29 CFR 1910.120 requires all employees involved in an HTRW activity, their supervisors, and management responsible for the activity to receive training before they are allowed to engage in HTRW activities that could expose them to hazardous substances or other related safety and health hazards. Employees are prohibited from participating in or in the on-site supervision of, HTRW activities unless they have been certified as having successfully completed the training to a level required by their position function and responsibilities. Initial worker training, approximately 40 hours off site and 3 days OJT under supervision of a trained supervisor can be obtained from a commercial source. Refresher worker training, approximately 8 hours can be obtained from a commercial source. Supervisor

training, approximately 40 hours initial plus 3 days OJT, plus 8 hours of specialized training. Workers on site occasionally for a specific limited task such as, but not limited to, ground water monitoring, land surveying, or geophysical surveying shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience.

u. Hearing Conservation. EM 385-1-1 requires that a hearing conservation program be developed to conform to DODI 6055.12 and AR 40-5. Employees exposed to continuous sound levels equal to or greater than an 8-hour time-weighted average of 85 decibels (dBA) or impact noise equal to or greater than 140 dBA. Training is at the time at initial assignment and as required thereafter. Competent project staff shall provide training.

v. Ladders. Twenty nine CFR 1926.1060 requires that a competent person train each employee that uses ladders about the following:

- (1) The nature of the workplace's fall hazards.
- (2) The proper construction, placement, use and care of all stairways and ladders.
- (3) The maximum intended load carrying capacities of ladders.
- (4) The standards contained in Subpart X, 29 CFR 1926.

Retraining shall occur as necessary to maintain employee understanding and knowledge for compliance.

w. Lead Abatement. Twenty-nine CFR 1926.62 requires training prior to a related job assignment for team members subject to exposure at or above the lead action level or where the possibility of related skin or eye irritation exists. Related job assignments include abrasive blasting, welding, torch cutting, burning, scraping, sanding demolition, salvage, removal or encapsulation of lead containing structures. These are assignments that should normally be contracted to lead abatement firms. If COE team members do perform these assignments, they need to fulfill all of the training and certification

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requirements of OSHA, EPA and the state having jurisdiction. There are Lead Abatement Supervisor (40 hours) courses, Lead Inspector Courses (24 hours), Lead Risk Assessor (16 hours) and Lead Abatement Worker (24 hours) as well as 8-hour refreshers for each. The courses are available from commercial sources.

x. Lifesaving and Safety Skiffs. Section 05.J of EM 385-1-1 requires that personnel be trained in launching and operating the safety skiff. Lifesaving personnel shall perform a lifesaving drill before initiation of work at the site and periodically thereafter (at least monthly or whenever new personnel are involved).

y. LockOut/TagOut, Control of Hazardous Energy. Section 12 of EM 385-1-1, ER 385-1-31 and 29 CFR 1910.147 requires lockout/tagout training for all employees involved with hazardous energy control procedures. Training is provided initially and at least annually thereafter as is necessary to maintain proficiency in related procedures. Training will include recognition of hazardous energy sources in the workplace, the types and magnitudes of energy associated with them and related lockout/tagout procedures. Training available commercially or by competent in-house personnel.

z. Monthly Supervisor Safety Meetings. As required by EM 385-1-1, the project/site manager holds these meetings with the project's supervisors to review accident experiences, countermeasures, ongoing or new hazardous activities and related control measures and other subjects to prevent accidents and ensure compliance with safety and occupational health requirements. These meetings are often held in conjunction with monthly safety meetings.

aa. Personal Protective Equipment. As required by Section 5 of EM 385-1-1 and 29 CFR 1910.132, training shall be provided, prior to initial use, for all employees required to wear PPE. Additionally, training shall be provided each time that new PPE is required and as needed to maintain proficiency in the use, maintenance and disposal of PPE. In addition to addressing the above PPE issues, supervisors need to teach their employees what specific PPE is required for their occupational hazards, how to properly don, doff, adjust and wear it, and the PPE's limitations.

bb. Powered Hand Tools. As required by 29 CFR 1926.302, all employees that are required to use powered hand tools should pass a proficiency test prior to use of such tools.

cc. Respiratory Protection. As required by 29 CFR 1910.134, all employees required to wear respirators, regardless of the length of use, shall be trained on the proper use. Training is as for other PPE, but also includes details of the facility's Respiratory Protection Program. This training must be provided by a competent person who has successfully completed an OSHA Respiratory Protection Course or equivalent training.

dd. Safe Lifting. As required by paragraph 14.A of EM 385-1-1, all employees shall be provided training on safe lifting techniques. The training is normally provided in-house. Refresher is recommended on an as-needed basis.

ee. Weekly Toolbox Meetings. As required by paragraph 01.B.03 of EM 385-1-1, foreman or supervisors shall conduct tool box meetings at least weekly to review past activities, plan for new or changed operations, establish or review activity hazard analyses and safe work procedures and provide team members other pertinent safety and health training. These meetings usually address the specific safety needs of the individual group.

ff. Welding Safety. EM 385-1-1 and 29 CFR 1910.253 requires welders, cutters and their supervisors to be trained in the safe operation of their equipment. American Industrial Hygiene Association's publication entitled "Welding Safety and Health" is recommended by EM 385-1-1 for use during this training. Employees in charge of oxygen or fuel-gas equipment shall be instructed about the safe use of this equipment and judged as competent by their employer for its use prior to being placed in charge of it.

gg. Wildfire Control. EM 385-1-1 requires training for all personnel on wildfire control teams. The training includes fire behavior suppression methods, communications, and the use and care of protective and fire fighting equipment.

3. Periodic Inspections, Tests or Checks. What follows is a summary of periodic inspections, tests or checks that may be required by each facility, along with the frequency and reference. This list is not considered to be all-inclusive.

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a. Breathing Air - Supplied from Cylinders or Compressors. The quality of breathing air from compressors that employees use is required to be maintained at Type 1, Grade D as defined by the Compressed Air Association.

(1) Regularly used compressor air is analyzed before initial use and a minimum of every 6 months or as needed. If compressor-supplied breathing air is used infrequently the air is tested within six months prior to usage. The results of these tests are valid for no more than six months from the time of sampling.

(2) Breathing air analysis is obtained from Texas Research Institute, 9063 Bee Caves Road, Austin TX 73733, phone 512-263-2101. All air analysis results are kept as documentation.

b. Confined Space Entry Program - Program Review and Drills. Each member of the rescue/emergency team shall practice making PRCS rescues at least once every 12 months. Facilities shall be re-evaluated at least once annually for the presence of confined spaces. At least annually, the designated official shall review the canceled permits for the past 12 months and revise the program as necessary (06.I.01.d, 05.f, 09.b).

c. Cranes & Hoists. Inspection required before initial use for all new and altered cranes; before initial use on a Corps project and periodically thereafter (1-12 months or as recommended by the manufacturer). In accordance with the manufacturer's recommendations (see EM 385-1-1, paragraph 16.C.12) the inspections shall be conducted by a qualified person and shall cover items listed in Appendix H of EM 385-1-1. An inspection program and schedule should be developed for all cranes/hoists and documentation kept. Load performance test shall be performed every four years.

d. Elevators: Passenger and Freight, Electric (ASME A17.1, Section 1001).

(1) Routine inspection and test shall be made at intervals not longer than six months and shall include inspections of hoistway and car doors or gates and their operating, locking, and contact devices. These inspections and tests shall be made by an inspector employed by the authority

having jurisdiction or by a person authorized by the authority having jurisdiction.

(2) Periodic inspection and tests shall be performed at intervals not longer than 1 year and include oil buffers (car and counterweight buffers), safeties (all working parts of the car and counterweight safeties), as well as testing the safeties with a no-load, slow speed test. These periodic inspections and tests performed by a competent elevator inspector, it shall authorize a qualified person to witness the inspection and tests on its behalf.

(3) Five year inspection test requirements consist of a rate-load, rated speed test and inspection of the car safeties, a no load, rated speed test and inspection of the counterweight safety, a tripping speed test and inspection of governors, a rated load speed test of the car oil buffer and a no load, rated speed test of the counterweight oil buffer.

e. Elevators: Passenger and Freight Hydraulic Elevators (ASME A17.1, Section 1004).

(1) Routine inspection and tests shall be made at intervals not longer than six months. These inspections and tests shall be made by an inspector employed by the authority having jurisdiction or by a person authorized by the authority having jurisdiction.

(2) Periodic inspection and tests shall be performed by a competent elevator mechanic at intervals not longer than 1 year. The COE inspector shall witness these periodic inspections and tests. Where the COE does not employ a qualified inspector, it shall authorize a qualified person to witness the inspection and tests on its behalf. The COE inspector shall witness these periodic inspections and tests.

(3) A 3-year inspection and test requirement also exists for pressure tanks, switches and unexposed portions of pistons.

(4) Five-year inspection test requirements consist of a rated-load, rated speed test and inspection of the car safeties, a no load, rated speed test and inspection of the counterweight

safety, a tripping speed test and inspection of governors, a rated load, rated speed test of the car oil buffer and a no load, rated speed test of the counterweight oil buffer.

NOTE on persons authorized to make elevator inspections and tests: The inspector shall meet the qualification requirements of the ASME QEI-1. Inspectors and inspection supervisors shall be certified by an organization accredited by ASME in accordance with the requirements of ASME QEI-1.

f. Emergency Eyewashes and Showers. Plumbed and self-contained showers shall be activated weekly to flush the line and to verify proper operation. Eye or face wash units shall be activated weekly to flush the line and to verify proper operation. Hand held drench hoses shall be activated weekly to flush the line and verify proper operation.

g. Fall Protection Equipment. Personal fall protection equipment shall be inspected before use each day to determine that it is in safe working condition. Defective equipment shall be immediately replaced. The manufacturer's recommendations shall be followed in the fitting, adjustment, use, inspection, testing and care of personal fall protection equipment. Personal fall protection equipment shall be used only for employee safeguarding. **Any such equipment subjected to impact loading shall be immediately removed from service and shall not be used again for employee safeguarding.** Employee and tools weight limit for personal fall protection equipment is 310 pounds.

h. Fire Survey. Annual survey of suitability and effectiveness of fire prevention and protection measures at each project or installation shall be made by a qualified persons and records maintained.

i. First Aid Kits. Contents shall be checked prior to their utilization and at least weekly when work is in progress (contractors) to ensure expended items are replaced or at least monthly at COE facilities.

j. Fixed Fire Suppression Systems. As required by NFPA 12, Carbon Dioxide Extinguishing Systems shall be physically inspected and weighed (or liquid level checked) semi-annually to ensure no leakage has occurred. Results shall be recorded on the container, tag attached to container or in a central location. If the net content shows a loss of 10% or more, the containers should be refilled. High-pressure cylinders shall not be recharged without hydrostatic tests (and re-marking) if more than 5 years have elapsed from the date of the last test. High-pressure cylinders continuously in service without discharging may be retained in service for a maximum of 12 years from the date of the last hydrostatic test. At the end of 12 years, they shall be discharged and retested before being returned to service. NOTE: Transporting charged carbon dioxide cylinders that have not been tested within 5 years may be illegal. Federal and local regulations should be consulted (paragraph 1-8.5.1, NFPA).

k. Fixed Ladders. All fixed ladder systems (on locks, access to cranes, towers, sumps, etc) shall be maintained in a safe condition. Inspections for rust, corrosion and deterioration shall be made at least annually, with more frequent inspections made if needed. Records shall be maintained of annual or regularly scheduled inspections and maintenance of fixed ladder systems (ANSI A 14.3).

l. Floating Plant Drills. On all floating plant which have a regular crew or on which people are quartered, the following drills shall be held at least monthly, during each shift (unless USCG requires more frequent): abandon ship or boat drills, fire drills, person overboard or rescue drills. The first set of drills shall be conducted within 24 hours of the vessel's occupancy or commencement of work (19.A.04.e-g). A record of all drills and emergency system checks (to include deficiencies noted and corrective action taken) shall be made in the station log.

m. Hazard Communication Inventory. For each project, an inventory of hazardous chemicals that can be found on site must be made at least annually, signed and dated. A Material Safety Data Sheet (MSDS) must be available at the facility or project site for each material included on the inventory.

n. Hydraulic Steel Structures - ER 110-2-8157. An inspection plan should be developed for each HSS.

(1) Initial Fracture Critical Members (FCM) Inspection. Special inspections are required for FCM on all existing HSS (stoplogs, bulkheads used for dewatering, related lifting beams) where failure of the FCM would result in probable loss of life and shall be completed prior to their next use.

(2) Initial FCM inspections of other HSS should have been completed by 31 December 1998.

(3) All FCM must be inspected every five years. If dewatering is required to complete this inspection, the engineer shall decide whether such inspections are required.

(4) Periodically, each HSS should be dewatered and thoroughly inspected every 25 years. More frequent may be required.

o. Lifesaving Drills. At least one skiff shall be immediately available at locations where employee work over or immediately next to water. Lifesaving personnel shall perform a lifesaving drill before the initiation of work at the site and periodically thereafter (at least monthly or whenever new personnel are involved).

p. LOTO Program-Inspections Program. A review of facility procedures by the responsible official, normally the site manager, shall be conducted annually. Annual refresher training is required for all affected personnel (ER 385-1-31). A review and audit shall be conducted annually by a District Team (OP and SO).

q. Personal Flotation Devices (PFD's). Before and after each use, the PFD shall be inspected for defects that would alter its buoyancy or strength.

r. Personal Protective Equipment. Manufacturer's use, inspection, testing and maintenance instructions shall be maintained with the PPE.

s. Portable Fire Extinguishers (NFPA 10, Chapter 4).

(1) Inspections. Extinguishers shall be inspected when initially placed in service and monthly thereafter. Inspection is a quick check to ensure the following:

- (a) That is available in its designated place.
- (b) Not obstructed and is visible.
- (c) Safety seals and tamper indicators are not broken or missing.
- (d) Free of obvious damage, corrosion, leakage and clogged nozzle.
- (e) Proper pressure gauge reading or indicator in operable range or position.
- (f) For wheeled units, the condition of the tires, wheel carriage, hose and nozzle.

The inspection shall be documented.

(2) Maintenance. Fire extinguishers shall not be subjected to maintenance not more than 1 year apart, at the time of hydrostatic test or when specifically indicated by an inspection.

(3) Hydrostatic testing (NFPA 10, Chapter 5). Hydrostatic testing shall be performed by persons trained in pressure testing procedures at intervals not exceeding those specified in Annex II.

t. Pressurized Equipment Systems.

(1) Low-pressure air and gas compressors (500 psi and less) shall be inspected and tested as below, every 12 months or at any time a malfunction or erratic operation indicates the need.

(a) Make a detailed visual inspection of the entire unit, paying particular attention to the exterior conditions or the receiver, gages, unloaders, relief devices, fittings, valves and hoses.

(b) Install a calibrated gage on the received discharge shutoff valve.

(c) Operate the compressor and check the operational gages for accuracy by comparing the pressure reading

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to the calibrated gage pressure reading. Check operation of all valves and ensure proper operation of the unloader. Check the operation of the safety valve.

(2) High pressure air and gas compressors (greater than 500 psi) shall be inspected and tested at 12 month intervals or any time a malfunction or erratic operation indicates the need. In addition, these shall also be subjected to a hydrostatic pressure test every 24 months or at any time a receiver shows evidence of bad dents, corroded areas, leakage, or other condition that indicate weakness which might render the receiver unsafe. All inspection and tests, including hydrostatic pressure tests, shall be in accordance with TB 43-0151.

u. USACE Motorboats and Auxiliary Equipment. All USACE motorboats and auxiliary equipment shall be inspected annually using the checklist at Appendix C of ER 385-1-91. Inspection results shall be maintained at the project and shall be made available upon request during a program audit.

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ANNEX I
TRAINING REQUIREMENTS MATRIX

Type Training	initial	weekly	monthly	Frequency					Remarks
				1 year	2 years	3 years	4 years	5 years	
ATV	4 hrs								Periodically
Asbestos Abatement									
Inspector	24 hrs			8 hrs					Medical Clear.
Mgmt Planner	16 hrs			8 hrs					
Supervisor/Comp. Person	40 hrs			8 hrs					Medical Clear.
Designer	32 hrs			8 hrs					
Abatement Worker	32 hrs			8 hrs					Medical Clear.
O&M Worker	16 hrs			8 hrs					Medical Clear.
Awareness	2-4 hrs			8 hrs					
Bloodborne Pathogens									
Trainer	20 hrs				16 hrs				
Employer	4 hrs			4 hrs					
Boat Operator									
District Director (SO)	40 hrs					Teach			
District Instructors	40 hrs					Teach			
District Operators	24 hrs							8 hrs	
Confined Space Entry									
Awareness (QAs & Others)	2-8 hrs								
Entrants	16 hrs								
Attendants	16 hrs								
Rescuers	32 hrs			4-8 hrs					
Supervisors	24 hrs								
CPR	4 hrs			4 hrs					
Crane Operator									
Instructor/Trainer	24 hrs*								Add'l trng & exp.
Operators	24 hrs			8 hrs*		Test			W/ test @ 3rd yr.
Defensive Driving	4 hrs					4-8 hrs			PC Based
Diving									
Divers	120 hrs						80 hrs		12 dives/year
Dive Inspectors	40 hrs						40 hrs		
Dive Supervisor	160 hrs						80 hrs		12 dives/year
District Dive Coordinator	40 hrs								
Drowning Prevention	X								
Emerg. Evac./Fire Prev.	X			X					
Emerg. Spill Response									
First Responder Aware.	4 hrs			2 hrs					
First Responder Ops. Level	8 hrs			8 hrs					
Hazmat Technicians	40 hrs			8 hrs					
Hazmat Specialist	40 hrs			8 hrs					
On-Scene Incident Cdr	40 hrs			8 hrs					

ANNEX II
FIRE EXTINGUISHER
HYDROSTATIC TESTING REQUIREMENTS

<u>Extinguisher Type</u>	<u>Test Interval (Years)</u>
Stored Pressure Water, Loaded Stream, and or Antifreeze	5
Wetting Agent	5
AFFF (Aqueous Film Forming Foam)	5
FFFP (Film Forming Fluoroprotein Foam)	5
Dry Chemical with Stainless Steel Shells	5
Carbon Dioxide	5
Dry Chemical Stored Pressure, with Mild Steel Shells, Brazed or Brass Shells, or Aluminum Shells	12
Dry Chemical, Cartridge or Cylinder or Cylinder Operated, with Mild Steel Shells	12
Halogenated Agents	12
Dry Powder, Stored Pressure, Cartridge or Cylinder Operated with Mild Steel Shells	12

NOTE 1: Stored pressure water extinguishers with fiberglass shells (pre 1976) are prohibited from hydrostatic testing due to manufacturer's recall.

NOTE 2: Non-rechargeable fire extinguishers shall not be hydrostatically tested but shall be removed from service at a maximum of 12 years from the date of manufacture. Non-rechargeable halogenated agent fire extinguishers shall be disposed of in accordance with paragraph 4-3.3.3.

NOTE 3: Every 6 years, stored pressure fire extinguishers that require a 12-year hydrostatic test shall be emptied and subjected to the applicable maintenance procedures.