

SECTION 5

PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

05.A GENERAL

05.A.01 Responsibilities.

a. The use of PPE is a control measure that is to be used only after a hazard evaluation identifies hazards associated with a particular job or activity, and it is determined that the hazards cannot be eliminated and/or controlled to an acceptable level through engineering design or administrative actions. Utilize process and engineering controls before PPE to protect employees.

b. Based on hazard evaluations conducted by supervisors, employers shall identify and select, and each affected employee shall use, PPE and safety equipment that will provide appropriate protection. > **See 29 CFR 1910.132.**

c. Employers shall communicate PPE and safety equipment decisions to each affected employee. Employees shall use all PPE and safety equipment that may be required to maintain their exposure within acceptable limits.

d. The employer will make all reasonable efforts to accommodate employees with religious beliefs that may conflict with determined PPE requirements. However, when reasonable efforts to accommodate employee's religious beliefs do not provide the necessary safe working environment (without PPE), then the employee must use the appropriate PPE or the employee will not be allowed to work in the area where the hazard requiring protection exists.

05.A.02 Employees shall be appropriately trained in the use and care of all required PPE and safety equipment.

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a. Employees must be trained in and shall demonstrate an understanding of the following aspects of PPE prior to use: selection (for specific hazard); donning, doffing and adjusting; limitations and useful life; inspection and testing; and proper care including maintenance, storage and disposal.

b. When the employer has reason to believe that any affected employee who has been trained does not have the understanding and skill required for the use of the PPE, the employer shall make certain that the employee receives the necessary re-training to acquire the appropriate skills.

c. The employer shall verify through written certification that each affected employee has received and understood the required training. The written certification shall identify the name of each employee trained, the date(s) of the training, and the subjects taught.

05.A.03 A copy of the manufacturer's use, inspection, testing, and maintenance instructions shall be maintained with the PPE and safety equipment.

05.A.04 Personal protective and safety equipment shall be tested, inspected, and maintained in a serviceable and sanitary condition as recommended by the manufacturer.

a. Defective or damaged equipment shall not be used. It shall be tagged as out of service and/or immediately removed from the work site to prevent use.

b. Previously used PPE must be cleaned, disinfected, inspected, and repaired as necessary before issuing to another employee.

05.A.05 When employees provide their own safety equipment or PPE, the employer is responsible for assuring its adequacy in protecting against the hazard and its state of repair.

05.A.06 Minimum requirements.

a. Employees shall wear clothing suitable for the weather and work conditions. For fieldwork (for example, construction sites, industrial operations and maintenance activities, emergency operations, regulatory inspections, etc.), at a minimum, this shall be:

(1) Short sleeve shirt;

(2) Long pants (excessively long or baggy pants are prohibited);
and

(3) Leather or other protective work shoes or boots.

b. Protective equipment shall be of heat, fire, chemical, and/or electrical-resistive material when conditions require protection against such hazards.

05.A.07 Miners' lights and flashlights used around explosives, and in atmospheres likely to contain explosive vapors, dusts, or gases shall be approved by the Mine Safety and Health Administration (MSHA) or National Institute for Occupational Safety and Health (NIOSH) for use in such locations.

05.A.08 Persons involved in activities that subject the hands to injury (for example, cuts, abrasions, punctures, burns, chemical irritants, toxins, vibration, and forces that can restrict blood flow) shall select and use hand protection appropriate for the hazard in accordance with ANSI/International Safety Equipment Association (ISEA) 105.

05.A09 Protective leg chaps shall be worn by workers who operate chain saws. Protective leg chaps must meet the specifications in American Society for Testing and Materials (ASTM) Standard F1897.

05.B EYE AND FACE PROTECTION

05.B.01 Persons shall be provided with eye and face protection equipment, as outlined in Table 5-1, when machines or operations

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present potential eye or face injury from physical, chemical, or radiation agents.

- a. Eye and face protection equipment shall meet the requirements of ANSI/ American Society of Safety Engineers (ASSE) Z87.1, and bear a legible and permanent "Z87" logo to indicate compliance with the standard.
- b. Eye and face protection equipment shall be distinctly marked to facilitate identification of the manufacturer.
- c. Employees shall use eye protection providing side protection.

05.B.02 When required by this regulation to wear eye protection, persons whose vision requires the use of corrective lenses in eyeglasses shall be protected by one of the following:

- a. Prescription safety glasses providing optical correction and equivalent protection;
- b. Protective glasses with sideshields designed to fit over corrective lenses without disturbing the adjustment of the glasses;
- c. Goggles that can be worn over corrective lenses without disturbing the adjustment of the glasses, or
- d. Goggles that incorporate corrective lenses mounted behind the protective lenses.

TABLE 5-1

EYE AND FACE PROTECTOR SELECTION GUIDE



A. Spectacle,
No sideshield



E. Spectacle,
Non-Removable
Lens



I. Cover Goggle,
Direct Ventilator



B. Spectacle, Half
Sideshield



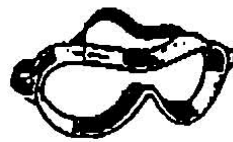
F. Spectacle,
Lift Front



J. Cup Goggle,
Direct Ventilator



C. Spectacle, Full
Sideshield



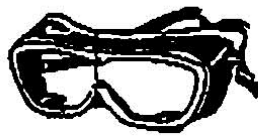
G. Cover Goggle,
No Ventilation



K. Cup Goggle,
Indirect Ventilator



D. Spectacle,
Detachable
Sideshield



H. Cover Goggle,
Indirect Ventilation



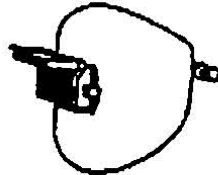
L. Spectacle,
Headband
Temple

Table 5-1 (CONTINUED)

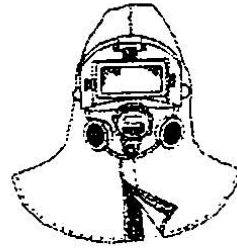
EYE AND FACE PROTECTOR SELECTION GUIDE



M. Cover Welding Goggle, Indirect Ventilation



Q. Welding Helmet, Lift Front



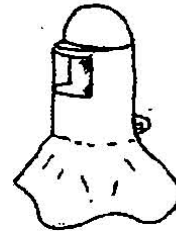
S. Respirator



N. Faceshield



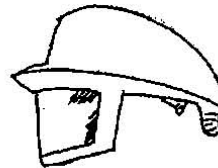
R. Respirator



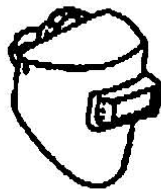
T1. Respirator



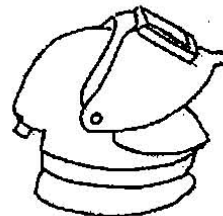
O. Welding Helmet, hand Hold



T2. Respirator



P. Welding Helmet, Stationary Window



U. Respirator

Table 5-1 (CONTINUED)

EYE AND FACE PROTECTOR SELECTION GUIDE

IMPACT: Chipping, grinding, machining, masonry work, riveting and sanding				
Assessment See Note (1)	Protector Type	Protectors	Limitations	Not Recommended
Flying fragments, objects, large chips, particles, sand, dirt, etc.	B, C, D, E, F, G, H, I, J, K, L, N	Spectacles, goggles, faceshields SEE NOTES (1)(3)(5)(6)(10) For severe exposures add N	Protective devices do not provide unlimited protection. SEE NOTE (7)	Protectors that do not provide protection from side exposure SEE NOTE (10) Filter or tinted lenses that restrict light transmittance, unless it is determined that a glare hazard exists. Refer to OPTICAL RADIATION.
HEAT: Furnace operations, pouring, casting, hot dipping, gas cutting, and welding				
Assessment See Note (1)	Protector Type	Protectors	Limitations	Not Recommended
Hot sparks	B, C, D, E, F, G, H, I, J, K, L, N	Faceshields, goggles, spectacles For severe exposure add N SEE NOTE (2)(3)	Spectacles, cup and cover type goggles do not provide unlimited facial protection SEE NOTE (2)	Protectors that do not provide protection from side exposure
Splash from molten metals	N	Faceshields worn over goggles H, K SEE NOTE (2)(3)		
High temperature exposure	N	Screen faceshields, reflective faceshields	SEE NOTE (3)	

Table 5-1 (CONTINUED)

EYE AND FACE PROTECTOR SELECTION GUIDE

CHEMICAL: Acid and chemical handling, degreasing, plating				
Assessment See Note (1)	Protector Type	Protectors	Limitations	Not Recommended
Splash	G, H, K N	For severe exposure add N	Ventilation should be adequate but protected from splash entry	Spectacles, welding helmets, hand shields
Irritating mists	G	Special purpose goggles	SEE NOTE (3)	
DUST: Woodworking, buffing, general industry conditions				
Assessment See Note (1)	Protector Type	Protectors	Limitations	Not Recommended
Nuisance dust	G, H, K	Goggles, eyecup and cover types	Atmospheric conditions and the restricted ventilation of the protector can cause the lenses to fog. Frequent cleaning may be required.	
OPTICAL RADIATION: Welding: electric arc				
Assessment See Note (1)	Protector Type	Protectors	Limitations	Not Recommended
O, P, Q	Typical filter lens shade		Protection from optical radiation is directly related to filter lens density. SEE NOTE (4). Select the darkest shade that allows adequate task performance.	Protectors that do not provide protection from optical radiation.

NOTES:

- (1) Care should be take to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards must be provided.
- (2) Operations involving heat may also involve optical radiation. Protection from both hazards shall be provided.
- (3) Faceshields shall only be worn over primary eye protection.
- (4) Filter lenses shall meet the requirements for shade designations in Table 5-2.
- (5) Persons whose vision requires the use of prescription (Rx) lenses shall wear either protective devices fitted with prescription (Rx) lenses with sideshields or protective devices designed to be worn over regular prescription (Rx) eyewear.
- (6) Wearers of contact lenses shall also be required to wear appropriate covering eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.
- (7) Caution should be exercised in the use of metal frame protective devices in electrical hazard areas.
- (8) Refer to ANSI/ASSE Z87-1, Section 6.5, Special Purpose Lenses.
- (9) Welding helmets or hand shields shall be used only over primary eye protection.
- (10) Non-sideshield spectacles are available for frontal protection only.

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05.B.03 Personnel who are considered blind in one eye and are working in other than administrative functions shall wear safety glasses with sideshields at all times.

05.B.04 Operations that require the use of, or exposure to, hot or molten substances (for example, babbitting, soldering, pouring or casting of hot metals, handling of hot tar, oils, liquids, and molten substances) shall require eye protection, such as goggles with safety lenses and screens for side protection, or face masks, shields, and helmets giving equal protection. Lens mountings shall be able to retain in position all parts of a cracked lens.

05.B.05 Operations that require handling of harmful materials (for example, acids, caustics, hot liquids, or creosoted materials) and operations where protection from gases, fumes, and liquids is necessary shall require the wearing of goggles with cups of soft pliable rubber and suitable faceshields, masks, or hoods that cover the head and neck, and other protective clothing appropriate to the hazards involved.

05.B.06 Operations where protection from radiant energy with moderate reduction of visible light is necessary, including welding, cutting, brazing, and soldering, shall require eye and face protection suitable to the type of work, providing protection from all angles of direct exposure, and with lenses of the appropriate shade. > **See Table 5-2.**

05.B.07 Glare-resistant glasses that comply with ANSI Z80.3 with an ultraviolet A-region (UVA) and ultraviolet B-region (UVB) 99% filtration shall be worn when conditions require protection against glare. When conditions so warrant, polarized lenses shall also be considered.

05.B.08 Tinted or automatically darkening lenses should not be worn when work tasks require the employee to pass often from brightly to dimly lighted areas.

TABLE 5-2

**REQUIRED SHADES FOR FILTER LENSES AND GLASSES IN
WELDING, CUTTING, BRAZING, AND SOLDERING**

OPERATION	SHADE NUMBER
Soldering	2
Torch Brazing	3 or 4
Cutting (light) up to 1 in (2.5 cm)	3 or 4
Cutting (medium) 1 to 6 in (2.5 to 15.2 cm)	4 or 5
Cutting (heavy) 6 in (15.2 cm) or more	5 or 6
Gas welding (light) up to 1/8 in (0.3 cm)	4 or 5
Gas welding (medium) 1/8 to 1/2 in (0.3 to 1.2 cm)	5 or 6
Gas welding (heavy) 1/2 in (1.2 cm) or more	6 or 8
Atomic hydrogen welding	10 – 14
Inert-gas metal-arc welding (nonferrous) - 1/16 to 5/32 in (0.1 to 0.4 cm) electrodes	11
Inert-gas metal-arc welding (ferrous) - 1/16 to 5/32 in (0.1 to 0.4 cm) electrodes	12
Shielded metal-arc welding - 1/16 to 5/32 in (0.1 to 0.4 cm) electrodes	10
Shielded metal-arc welding - 3/16 to 1/4 in (0.4 to 0.6 cm) electrodes	12
Shielded metal-arc welding - 5/16 to 3/8 in (0.7 to 0.9 cm) electrodes	14
Carbon arc welding	14

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05.C HEARING PROTECTION AND NOISE CONTROL

05.C.01 Sound-pressure level limits.

a. Non-DOD personnel shall be provided, as a minimum, protection against the effects of hazardous noise exposure whenever the sound-pressure level exceeds the limits and/or exposure times specified in Table 5-3.

b. DOD-personnel shall be provided protection against the effects of hazardous noise exposure whenever sound-pressure levels exceed 85 decibels A-weighted [dB(A)] steady-state expressed as a time-weighted average (TWA) as specified in Table 5-4 or 140 dB(A) impulse.

05.C.02 Practical engineering or administrative controls shall be considered and used when personnel are subjected to sound-pressure levels exceeding the limits specified in Tables 5-3 and 5-4. When such controls fail to reduce sound-pressure levels to within the specified limit, PPE shall be selected, evaluated, provided, and used in accordance with the hearing conservation program.

05.C.03 Hearing protection provided must be capable of reducing worker noise exposure below an 8-hour TWA of 85 dB(A). When hearing protection devices do not provide sufficient attenuation to reduce the worker noise exposure level below 85 dB(A), administrative control of exposure will be necessary.

TABLE 5-3
PERMISSIBLE NON-DoD NOISE EXPOSURES
(Contractor)

Duration/day (hours)	Sound-pressure level dB(A) slow response
8	90
6	92
4	95
3	97
2	100
1-1/2	102
1	105
1/2	110
1/4	115

When the daily noise exposure is composed of two or more periods of noise exposure of different levels, the combined effects should be considered rather than the individual effect of each. Exposure to different levels for various periods of time shall be computed according to the following formula:

$$C_n = T_1 / L_1 + T_2 / L_2 + \dots + T_3 / L_3$$

Where:

- C = combined noise exposure factor,
 - T = the total time of exposure at a specified sound-pressure level (in hours),
 - and
 - L = the total time of exposure permitted at that level (in hours), from Table 5-3.
- If $C_n > 1$, hearing protection is required.

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05.C.04 Whenever sound-pressure levels equal or exceed 85 dB(A) (measured as an 8-hour TWA), a continuing, effective hearing conservation program shall be administered in accordance with 29 CFR 1910.95. For DOD personnel the hearing conservation program shall conform to DODI 6055.12 and Department of the Army Pamphlet (DA Pam) 40-501.

05.C.05 When sound-pressure levels exceed 115 dB(A) steady-state, personal ear protection equivalent to the combination of earplugs and earmuffs shall be required.

05.C.06 Sound-pressure level measurements shall be made by qualified personnel using calibrated instruments.

05.C.07 Ear insert devices, to include disposable, preformed, or custom molded earplugs, shall be fitted to the exposed individual by an individual trained in such fitting and able to recognize the difference between a good and a poor fit. Plain cotton is not an acceptable protective device.

05.C.08 Noise hazard areas (areas in which sound-pressure levels exceed the limits specified in 05.C.01) shall be marked with caution signs indicating both the presence of hazardous noise levels and the requirement for hearing protection.

Table 5-4
Permissible DoD Noise Exposures
(Government)

Duration/day (hours)	Sound-pressure level dB(A) slow response
No limit	80
9 ½	84
8	85
4 ¾	88
3 ¼	90
1 ½	95
½	100
¼	105

05.D HEAD PROTECTION

05.D.01 All persons working in or visiting hard hat areas shall be provided with and required to wear Type I or Type II, Class G (General - low voltage electrical protection) or Class E (Electrical – high voltage electrical protection) headgear. For emergency response operations and other activities with greater need for side impact protection, Type II head protection is recommended. > **See Appendix B.**

- a. Hard hat areas or activities are those areas with potential hazard of head injury; in general, all construction areas are considered hard hat areas. However, areas may be considered non-hard hat areas, or activities may be considered non-hard hat activities, if identified and properly documented in the associated AHA. The identification and analysis of head hazards will be documented in an AHA, APP, or project safety and health plan, as appropriate.

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b. Points of entry to a hard hat area shall have a sign warning of the requirement to wear hard hats.

05.D.02 All protective headgear shall meet the requirements of ANSI Z89.1.

a. No modification to the shell or suspension is allowed except when such changes are approved by the manufacturer.

b. Hard hats shall be worn with the bill facing forward unless the GDA has determined exceptions for certain trades in order to accommodate appropriate mission accomplishments. Headgear must be designed to accommodate these needs.

c. Protective headgear worn near electric lines and equipment shall be Class E.

d. No ball caps, knit caps, or other headdress shall be worn under the hard hat that could interfere with the fit or stability of the hard hat.

05.D.03 Protective headgear and components shall be visually inspected on a daily basis for signs of damage (dents, cracks, etc.) that might reduce the degree of safety integrity originally provided. Headgear will be periodically inspected for ultraviolet degradation as evidenced by cracking or flaking of the helmet.

05.D.04 Drilling holes or in any way changing the integrity of the hard hat is prohibited. Alterations that will reduce the dielectric or impact strength will not be made.

05.D.05 Protective headgear worn by USACE employees shall (in addition to complying with the preceding specifications) be:

a. White in color and marked with a 1 in. (2.5 cm) band of red reflective material placed along the base of the crown with a 5 in. (12.7 cm) break in front. A red Corps of Engineers castle insignia will be centered at the front of the hat with the base of the insignia approximately $\frac{3}{4}$ in (1.9 cm) above the base of the

crown. Personnel may place their name above the insignia and their organization title below the insignia: the rank of military personnel should precede their name. An American Flag insignia may be worn on the back of the hard hat.

b. Requests for variations in color and marking to accommodate occupational specialties shall be submitted for consideration to HQUSACE Safety and Health Office.

c. Chin straps will be worn when wearers are subject to high wind conditions and/or working on elevated structures.

05.E PROTECTIVE FOOTWEAR

05.E.01 Protective footwear that addresses the hazard(s) identified in the PHA/AHA shall be provided and worn.

05.E.02 All protective footwear shall meet ASTM F2412 and F2413 standards.

05.E.03 Add-on type devices, such as strap-on foot, toe or metatarsal guards, shall not be used as a substitute for protective footwear and must be demonstrated by the employer to be equally effective via independent testing data for these devices).

05.E.04 For activities in which USACE or contractor personnel or official visitors are potentially exposed to foot hazards, the applicable PHA/AHA, APP, or project safety and health plan shall include an analysis of, and prescribe specific protective measures to be taken for, reducing foot hazards.

05.E.05 Personnel shall, as a minimum, wear safety-toed boots meeting ASTM Standards F2412 and F2413 while working on construction sites unless it can be demonstrated by a PHA/AHA to the GDAs satisfaction that a different type of foot protection is required.

05.E.06 Footwear providing protection against impact and compressive forces, conduction hazards, electrical hazards,

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and sole puncture shall comply with the applicable requirements of ASTM F2412 and F2413. Footwear providing protection against impact and compression hazards shall be rated as I/75 and C/75.

a. Unexploded ordnance (UXO) personnel whose job tasks required protective footwear but require no metal parts in or on their footwear shall wear Conductive footwear (Cd) with protective toe cap/composite toe footwear.

b. Personnel participating in wild land fire management activities shall wear leather lace-up boots with slip-resistant soles, such as a hard rubber lug-type or tractor tread, a top height of 8 in (20.3 cm) or more with composite toes. Soles shall not be made of composition rubber or plastic, which have low melting points.

05.F HIGH-VISIBILITY APPAREL

05.F.01 High-visibility apparel meeting, at minimum, ANSI/ISEA 07-2004 Performance Class 2 requirements, shall be worn by workers (such as, but not limited to, signal persons, spotters, survey crews and inspectors) whenever:

a. Workers are exposed to vehicular or equipment traffic at speeds up to 45 mph (72.4 kph);

b. There is limited visibility of workers exposed to mobile/heavy equipment operations, vehicles, load handling, or other hazardous activities;

c. Reduced visibility conditions exist due to weather conditions, illumination, or visually complex backgrounds where ambient visibility is at least 50 ft (15.2 m); OR

d. Workers are involved in activities in close proximity to vehicular traffic with no protective barriers.

05.F.02 If any or all of the following conditions exist, a determination shall be made by the SSHO, based on a risk assessment, as to whether Performance Class 3 high-visibility apparel is needed for higher visibility of workers. If so, they shall be worn by workers.

- a. Workers are exposed to vehicular or equipment traffic in excess of 45 mph (72.4 kph);
- b. Reduced visibility conditions exist due to weather conditions, illumination, or visually complex backgrounds where ambient visibility is less than 50 ft (15.2 m); OR
- c. Workers are performing tasks which divert attention from approaching vehicular traffic, traveling in excess of 45 mph (72.4 kph), as posted.

05.F.03 The apparel background material color shall be either fluorescent yellow-green, fluorescent orange-red, or fluorescent red (see ANSI/ISEA 107). When choosing color, optimization of color conspicuity between the wearer and work environment shall be considered.

05.G RESPIRATORY PROTECTION

05.G.01 General. The use of respirators is required when occupational exposure levels exceed OSHA Permissible Exposure Limits (PELs) or American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), and engineering or administrative exposure controls are not feasible to implement.

05.G.02 The voluntary use of dust masks (filtering face piece respirators) is permissible in atmospheres that are not hazardous. Prior to use of the voluntary respirators (including filtering face pieces), they must be evaluated and approved by the respiratory program administrator to ensure that the respirator use will in itself not create a hazard. If filtering face piece respirators are used, the

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employer shall provide the respirator users with the information contained in Appendix D of OSHA Standard 29 CFR 1910.134.

05.G.03 Written respiratory protection program. A written respiratory protection program shall be developed and implemented when respirators are used.

a. All employees using respirators, with the exception of employees voluntarily using only filtering face pieces (NIOSH-approved dust masks), shall be included in the respiratory protection program.

b. A respiratory protection program administrator with the technical qualifications (training and experience) and administrative authority to develop, implement and update (as necessary) the respiratory protection program shall be identified and so designated in the program.

(1) The program administrator shall ensure that all respirator users (voluntary users included) comply with the requirements of the program.

(2) Program Administrator Qualifications. The program administrator shall have the documented knowledge and experience to understand OSHA's respiratory protection standard (29 CFR 1910.134), evaluate respiratory hazards at the facility/project, select appropriate respirators based on facility/project hazards or potential hazard, and train employees on the use of selected respirators.

c. Respiratory protection programs shall address each of the following topics:

(1) Methods used to identify and evaluate workplace respiratory hazards;

(2) Procedures for selecting respirators for use in the workplace;

- (3) Medical evaluations of employees required to use respirators;
- (4) Fit testing procedures for tight-fitting respirators;
- (5) Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;
- (6) Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;
- (7) Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;
- (8) Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;
- (9) Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and
- (10) Procedures for regularly evaluating the effectiveness of the program.
- (11) Project/facility specific voluntary use guidelines and a requirement for voluntary users to learn and understand the contents of 29 CFR 1910.134 Appendix D, Information for Employees Using Respirators When Not Required Under the Standard.

05.G.04 Medical evaluation. All employees, with the exception of employees voluntarily using filtering face pieces, shall be medically evaluated to ensure they are fit enough to wear the selected respirators. Evaluation options for respirator use are as follows:

- a. Physical Examination. A physical examination for the purpose of clearing an employee to wear a selected respirator,

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supervised by a Board-Certified Occupational Medicine Physician. Medical clearances to wear respirators shall include the following:

(1) Telephone, e-mail, and physical address of the medical facility/provider;

(2) Printed name of the licensed, certified health care provider along with his/her signature;

(3) The statement of clearances or respiratory limitations only (no personal medical information shall be included. Employee identification shall not include the full social security number);

(4) Date of examination and date that clearance expires.

b. Respirator Medical Evaluation Service. An on-line, mail-in or in-person evaluation service for the purpose of clearing an employee to wear selected respirators may be used provided it is supervised by a Board-Certified Occupational Medicine Physician and based upon Appendix C to 29 CFR 1910.134, OSHA Respirator Medical Evaluation Questionnaire. Medical clearances to wear respirators shall include the information in (1) – (4) above.

c. Additional Medical Evaluations shall be provided when:

(1) An employee reports medical signs or symptoms that are related to the ability to use a respirator;

(2) A supervisor or the respirator program administrator informs the employer that an employee needs to be reevaluated;

(3) Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation;

(4) A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a

substantial increase in the physiological burden placed on an employee, OR

(5) It has been two years since the last medical evaluation.

05.G.05 Fit testing. Employees wearing respirators with tight-fitting face pieces [Supplied Air Respirators (SARs) and Self-Contained Breathing Apparatus (SCBAs) included] shall be fit tested to ensure that selected respirators achieve a proper face to face piece seal. Fit testing shall be performed before initial use of the selected respirator, whenever respirator size, make or model is changed, and at least annually thereafter. Fit testing requirements shall comply with respiratory protection program requirements.

05.G.06 Training and information. The program administrator or his designee shall provide respirator user training annually (or when requirements change significantly due to process changes or changes in site specific operations) to personnel using respirators at the facility or project. Annual training shall ensure that each employee using a respirator can demonstrate knowledge of the following topics:

- a. Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- b. Limitations and capabilities of the respirator;
- c. How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- d. How to inspect, put on and remove, use, and check the seals of the respirator;
- e. Procedures for maintenance and storage of the respirator;
- f. How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and

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g. The general requirements of the OSHA respirator standard at 29 CFR 1910.134.

05.G.07 Recordkeeping. Establish and retain written information regarding medical evaluations, fit testing, and the respirator program. The following shall be made available upon request:

a. Records of medical evaluations must be retained and made available, as needed;

b. Fit test records must be maintained for respirator users until the next fit test is administered. Establish a record of the Qualitative Fit Test (QLFT) and Quantitative Fit Test (QNFT) administered to an employee including:

- (1) The name or identification of the employee tested;
- (2) Type of fit test performed and name of the test administrator;
- (3) Specific make, model, style, and size of respirator tested;
- (4) Date of test; and
- (5) The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.

c. Retain a written copy of the current respirator program.

05.H FULL BODY HARNESES, LANYARDS, AND LIFELINES.

05.H.01 Full body harnesses, lanyards and lifelines are considered components of personal fall protection systems. Requirements for these components can be found in Section 21.H.05.

05.H.02 Lineman's equipment (electrically rated harnesses). The full body harness used around high voltage equipment or structures shall be an industry designed "Linemen's FP Harness" that will resist arc flashing. See 21.H.05.d.(2).

05.I ELECTRICAL PROTECTIVE EQUIPMENT

05.I.01 Persons working on electrical distribution systems shall be provided with the appropriate electrical protective equipment. This equipment shall be inspected, tested, and maintained in safe conditions in accordance with Table 5-5.

05.I.02 Employees shall use rubber gloves, sleeves, blankets, covers, and line hoses as required by special conditions for work on energized facilities. Rubber goods provided to protect employees who work on energized facilities must meet ASTM F18 standards. Electrical workers' rubber insulating protective equipment shall be visually inspected for damage and defects prior to each use.

05.I.03 Rubber protective equipment must be subjected to periodic electrical tests. Rubber insulating gloves shall be inspected before first issue and every 6 months thereafter; rubber insulating blankets and sleeves shall be inspected before their first issue and every 12 months thereafter. Rubber insulating covers shall be inspected upon indication that insulating value is suspect (per 1910.137).

TABLE 5-5

STANDARDS FOR ELECTRICAL PROTECTIVE EQUIPMENT

SUBJECT	NUMBER AND TITLE
Head Protection	ISEA/ANSI Z89.1, <i>Requirements for Protective Headwear for Industrial Workers</i>
Eye and face protection	ANSI Z87.1, <i>Practice for Occupational and Educational Eye and Face Protection</i>
Gloves	ASTM D120-02a, <i>Standard Specification for Rubber Insulating Gloves</i>
Sleeves	ASTM D1051, <i>Standard Specification for Rubber Insulating Sleeves</i>
Gloves and sleeves	ASTM F496, <i>Standard Specification for In-Service Care of Insulating Gloves and Sleeves</i>
Leather protectors	ASTM F696, <i>Standard Specification for Leather Protectors for Rubber Insulating Gloves and Mittens</i>
Footwear	ASTM F1117, <i>Standard Specification for Dielectric Overshoe Footwear</i>
	<u>ASTM 2412, Standard Test Methods for Foot Protection</u>
	<u>ASTM 2413, Standard Specification for Performance Requirements for Foot Protection</u>
Visual inspection	ASTM F1236, <i>Standard Guide for Visual Inspection of Electrical Protective Rubber Products</i>
Apparel	ASTM F1506, <i>Standard Performance Specification for Flame Resistant Textile Materials for Wearing Apparel for Use by Electrical Workers When Exposed to Momentary Electric Arc and Related Thermal Hazards</i>

05.1.04 Electric arc flash protection shall be provided for any person who enters the flash protection zone. **> See 11.B.** They must wear flame-resistant clothing and PPE, based on the incident exposure associated with the specific task. Refer to NFPA 70E for specific Hazard Risk Classifications and clothing/equipment requirements. **> Synthetic clothing such as acetate, nylon, polyester, rayon, either alone or in blends with cotton, may not be worn while in the flash protection zone.**

a. Employees must wear protective eye equipment whenever there is a danger from electric arcs, flashes, flying objects, or electrical explosion.

b. Employees must wear flame-resistant clothing whenever they may be exposed to an arc flash.

(1) If used, flash suits and their closure design must permit easy and rapid removal.

(2) The entire flash suit, including the window, must have energy-absorbing characteristics suitable for arc flash exposure.

(3) Use clothing and equipment to maximize worker protection.

(4) Clothing and equipment required by the degree of electrical hazard exposure can be worn alone or be integrated with normal apparel.

(5) Protective clothing and equipment must cover associated parts of the body and all normal apparel that is not flame-resistant, while allowing movement and visibility.

> Synthetic materials that can melt next to skin shall not be worn.

c. Employees must wear rubber-insulating gloves where there is a danger of hand or arm injury from electric shock or arc flash burns due to contact with energized parts. Gloves made from layers of flame-resistant material provide the highest level of

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protection. Leather glove protectors should be worn over voltage-rated rubber gloves.

d. Dielectric overshoes are required where electrically insulated footwear is used for protection against step and touch potential.

05.1.05 An air test shall be performed on electrical workers' rubber insulating gloves before each use.

05.1.06 Protective equipment of material other than rubber shall provide equal or better electrical and mechanical protection.

05.1.07 Live-Line (Hot-Line) Tools must be manufactured to meet ASTM F18 series as appropriate to the device and material. The insulating tool portion shall be made of fiberglass-reinforced plastic (FRP).

05.1.08 Only live-line tool poles having a manufacturer's certification to withstand at least the following test shall be used: 100 (kilo Volts) kV ac per ft (305 mm) of length for 5 minutes or 75 kV ac per ft (305 mm) for FRP tools. Records shall be maintained for all live-line tools to demonstrate satisfactory accomplishment of laboratory and shop test.

05.1.09 Wooden tools are not authorized for use. > **All wooden tools shall be replaced with FRP tools within 2 years of date of this manual.**

05.1.10 When using live-line tools, workers shall use voltage rated gloves and not place their hands closer than necessary to energized conductors or to the metal parts of the tool.

05.1.11 Only tools and equipment intended for live-line bare hand work should be used on transmission lines. The tools shall be kept dry and clean and shall be visually inspected before use each day.

05.1.12 See Section 05.H for requirements on lineman's personal fall protection equipment.

05.J PERSONAL FLOTATION DEVICES

05.J.01 Inherently buoyant Type III, Type V work vests, or better USCG-approved personal flotation devices (PFDs) shall be provided and properly worn (zipped, tied, latched, etc., in closed fashion) by all persons in the following circumstances: > See 05.J.02; See Figure 5-1.

- a. On floating pipelines, pontoons, rafts, or stages;
- b. On structures or equipment extending over or next to water except where guardrails, personal fall protection system, or safety nets are provided for employees;
- c. Working alone at night where there are drowning hazards, regardless of other safeguards provided;
- d. In skiffs, small boats, or launches, unless in an enclosed cabin or cockpit; or
- e. Whenever there is a drowning hazard.

05.J.02 Automatic-Inflatable PFDs Type V or better, USCG-approved for Commercial Use, may be worn by workers in lieu of inherently buoyant PFDs (See conditions 05.J.01.a-e above), provided the following criteria are met:

- a. PFDs are worn only by workers over 16 years of age and those who weigh 90 lb (40.8 kg) or more;
- b. An AHA must be performed for this activity;
- c. PFDs must be inspected, maintained, stowed and used only in accordance with the manufacturer's instructions (currently not intended to be used in areas of heavy construction or maintenance or where hot work (welding, brazing, cutting, soldering, etc.) is to be performed;

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d. PFDs shall provide a 30-pound minimum buoyancy post-deployment;

e. USACE employees shall comply with USACE's Auto-Inflatable Personal Flotation Device, Standards of Use Procedures, dated 1 July 2007.

f. The USCG-approval for auto-inflatable PFD's is contingent upon the PFD being worn, not stowed. All auto-inflatable PFDs must be worn at all times drowning hazard exists.

05.J.03 All wearable PFDs shall be of a highly visible orange/reddish color. Each PFD shall have at least 31 in² (200 cm²) of retroreflective material attached to its front side and at least 31 in² (200 cm²) on its back side, per USCG requirements (46 CFR Part 25.25-15).

05.J.04 Each PFD shall be equipped with a USCG-approved automatically activated light. Lights are not required for PFDs on projects performed exclusively during daylight hours.

05.J.05 Before and after each use, the PFD shall be inspected for defects that would alter its strength or buoyancy.

05.J.06 Throwable devices (Type IV PFD).

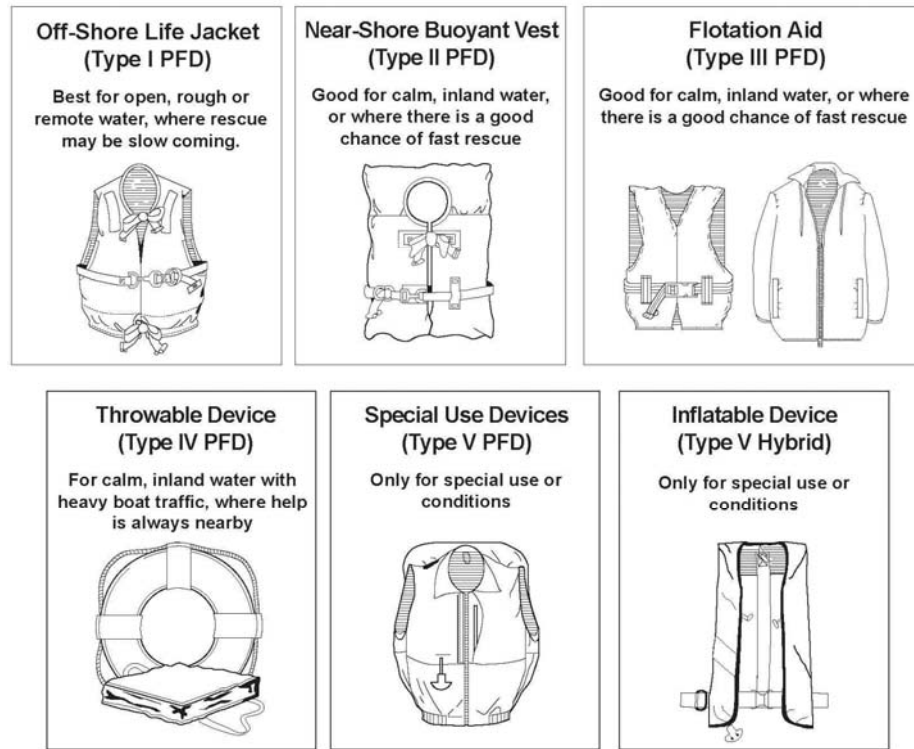
a. On USCG-inspected vessels, ring buoys are required to have automatic floating electric water lights (46 CFR 160).

b. On all other floating plant and shore installations, lights on life rings are required only in locations where adequate general lighting (e.g., floodlights, light stanchions) is not provided. For these plants and installations, at least one life ring, and every third one thereafter, shall have an automatic floating electric water light attached.

c. All PFDs shall be equipped with retroreflective tape in accordance with USCG requirements.

FIGURE 5-1

PERSONAL FLOTATION DEVICES



d. Life rings (rope attachment not required) and ring buoys (rope attachment required) shall be USCG-approved; shall have at least 70 ft (21.3 m) of 3/8 in (0.9 cm) of attached solid braid polypropylene, or equivalent. Throw bags may be used in addition to life rings or ring buoys. Life rings or ring buoys shall be readily available and shall be provided at the following places:

- (1) At least one not less than 20 in (51 cm) on each safety skiff up to 26 ft (7.9 m) in length (46 CFR 117.70).;

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(2) At least one (1) 24 in (61 cm) in diameter on all motor boats longer than 26 ft (7.9 m) in length up to 65 ft (19.8 m) in length and for motor boats 65 ft (19.8 m) in length or longer, a minimum 3 life buoys of not less than 24 in (61 cm) and one additional for each increase in length of 100 ft (30.4 m) or fraction thereof; and

(3) At least one (1) at intervals of not more than 200 ft (60.9 m) on pipelines, walkways, wharves, piers, bulkheads, lock walls, scaffolds, platforms, and similar structures extending over or immediately next to water, unless the fall distance to the water is more than 45 ft (13.7 m), in which case a life ring shall be used. (The length of line for life rings at these locations shall be evaluated, but the length may not be less than 70 ft (21.3 m).)

05.J.07 At navigation locks, an analysis of the benefits versus the hazards of using floating safety blocks (blocks that may be quickly pushed into the water to protect individuals who have fallen in the water from being crushed by vessels) shall be made.

a. This analysis shall be documented as an AHA.

b. If the use of blocks is found acceptable, consideration shall be given to the size and placement of the blocks, the appropriate means of securing and signing the blocks, etc. When the use of blocks is found unacceptable, alternative safety measures shall be developed.

05.K LIFESAVING AND SAFETY SKIFFS

05.K.01 At least one skiff shall be immediately available at locations where employees work over or immediately next to water. Skiffs shall be kept afloat or ready for instant launching.

05.K.02 Personnel trained in launching and operating the skiff shall be readily available during working hours. Lifesaving personnel shall perform a lifesaving drill, including the launching and recovery of the skiff, before the initiation of work at the site and periodically

thereafter as specified by the GDA (but at least monthly or whenever new personnel are involved).

05.K.03 Skiffs shall be kept afloat or ready for instant launching.

05.K.04 Required equipment must be onboard and meet or exceed USCG requirements and the requirements of Section 19 of this manual. Skiffs shall be equipped as follows:

- a. Four (4) oars (two (2) if the skiff is motor powered);
- b. Oarlocks attached to gunwales or the oars;
- c. One (1) ball-pointed boat hook;
- d. One (1) ring buoy with 70 ft (21.3 m) of 3/8 in (0.9 cm) solid braid polypropylene, or equivalent, line attached; and
- e. PFDs in number equaling the skiff rating for the maximum number of personnel allowed on board.
- f. Fire Extinguisher.

05.K.05 In locations where waters are rough or swift, or where manually operated boats are not practical, a power boat suitable for the waters shall be provided and equipped for lifesaving.

05.K.06 Skiffs and power boats shall have buoyant material capable of floating the boat, its equipment, and the crew.

05.K.07 On vessels (such as skiffs) without permanently mounted navigation lights, portable battery-operated navigation lights will be available and used for night operations.

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